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Covering the TI99/4A, the Myarc 9640 and compatibles

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# MICROpendium

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Volume 4 Number 5

June 1987

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Bustin' out all over

BASIC

new  
products

Freeware

June

hardware  
projects

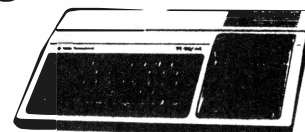
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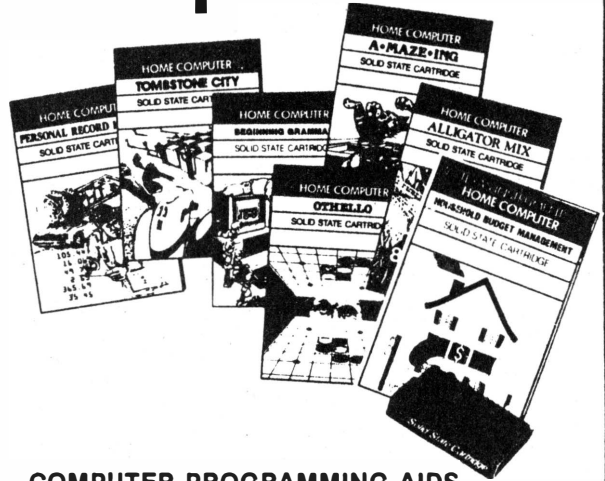
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Laura Burns.....Editor

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### Coming next month

- Review of M-DOS for the Geneve
- Users who compute religiously
- Modifying the TI reset circuit

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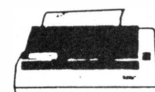
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# Comments

## New products highlight summer

Among the most interesting software products to come out recently for the TI is CorComp's TI-PC text transfer program. While this program does not provide PC-4A compatibility, it does allow users to load PC-created text files into the TI, and vice versa. The program lets the TI read DOS-formatted disks, which means a TI user can take a document created on a PC at the office and load it into his TI, or vice versa. (Of course, you can do the same thing using a direct RS232 connection or a modem, but it would seem hard to beat this text transfer for convenience.) We're still waiting for a copy of this unique program, but it looks like a winner.

### DOS IS FINALLY OUT

Myarc's DOS is finally here. I got mine a couple of days ago, too late to get it into a review for this edition. (Ironically, we do have a review of a disk operating system, 4A-DOS, but it runs on the 4A while M-DOS, of course, is for the Geneve.) A couple of quick points about M-DOS: it provides support for disk drives (I can now use Multiplan) and its operations appear to match the description of it in the hefty Geneve manual.

I've had the final version of one part of M-DOS, the GPL loader, for several weeks. This program loads into memory and allows you to select one of five processing speeds (the slowest is the 4A mode and the fastest is the straight GPL mode for use with programs that are written in GPL (such as Multiplan). The top speed is about 3.25 times faster than the slowest speed. In between, speeds are 2x, 2.25x and 3x faster than the slowest speed. The GPL loader also is used to load cartridges saved to disk. Using the loader, I have not found any cartridges that failed to load.

### SMALLER EDITIONS

We've cut back to 40 pages for this and last month's editions. We're doing this because advertising has fallen off a bit and because we want to save a few bucks. We figure to be back to 48 in the next month or so.

### A c COLUMNIST WOULD BE NICE

We're interested in securing the services of someone to write a column about c. We could probably use enough material to fill up to two pages per month. A series of tutorials might be effective for starters. Readers with expertise in c and an interest in writing about it are encouraged to submit a sample column.

### MORE ON THE GENEVE

Myarc is moving full-bore into production of the Geneve, now that it has M-DOS finalized. Also ready for production is Advanced BASIC, My-Word and a Lotus 1-2-3 compatible spreadsheet called My-Number. I'm told the spreadsheet will be marketed in August. It is actually a Lotus look-a-like that has been around for a year or two and has been ported from a PC environment to a TI environment. Myarc's Paul Charlton is handling the translation.

The Myarc hard disk controller has been redesigned using a gate array. The change was prompted by a desire for greater flexibility, according to Myarc. The controller will now support a streaming tape backup system for a hard disk and will allow users to use their VCRs to back up a hard disk. The controller will support hard disks of up to 134 megabytes — three of them, no less.

By the end of the summer you can also expect to see the release of the My-Art drawing program. It will require the Myarc Mouse.

A BASIC compiler is also expected this summer. Peter Hoddie is the programmer in charge of this Myarc project. According to Myarc, the compiler will compile any version of BASIC, from TI BASIC through Advanced BASIC, that runs on the TI. It will turn the BASIC code into machine code. Programs will then fly, I'm told.

Myarc is confident of a timely release of these products since the company is working with already available software that needs only to be adapted to the Geneve. A company spokesman points out that M-DOS had to be developed from scratch, which is why it has taken so long for it to be released.

### LOOKING FOR A GENEVE COLUMNIST

The Geneve is the new kid on the block, and we're looking for a columnist to cover it. Requirements include possession of a production model of the 9640, M-DOS, etc. and a strong background in at least two TI programming languages, one of which must be BASIC. We'd like to carry at least two pages per month. Being a new machine, the column can start from scratch and roam to new heights. Send us a sample column and a few ideas of what you'd like to do.

—JK

## Reviewed in MICROpendium

### 1984

**February:** B-1 Nuclear Bomber, Tandon TM-100 Disk Drive, Void, Beastalk Adventure, Microsurgeon, On Gaming, Database 500.  
**March:** Star Trek, Escape From Balthazar, Garkon's Getaway, Sky Diver, Mail-Call, Prowriter 8510 Printer.  
**April:** Monthly Budget's Master, Budget Master, Home Budget, Thief, Donkey Kong, Khe Sanh.  
**May:** Companion Word Processor, Q\*Bert, Mad-Dog I & II, Programs for the TI Home Computer.  
**June:** Creative Expressions Accounts Receivable/Accounts Payable, CDC 9409 Disk Drive, Starship Concord, Lost Treasure of the Aztec, ASW Tactics II.  
**July:** Theon Raiders, Introduction to Assembly Language for the TI Home Computer, Game of Wit, Pole Position.  
**August:** TE-1200, Tower, Galactic Battle, Galaxy.  
**September:** Wycove Forth, 99/4 Auto Spell-Check, QUICKCOPYer, Wizard's Dominion, Anchor Automation Mk XII Modem.  
**October:** Killer Caterpillar, ZORK I, Defender.  
**November:** 9900 Disk Controller Card/Manager, Super Bugger, Transtar 120S printer, Floppy-Copy, Data Base-X.  
**December:** Gravity Master, Data Base Manager System, Learning 99/4A

### Assembly Language Programming

### 1985

**January:** Super Sketch, Foundation Computing 128K Card, PTERM-99, TI-Runner.  
**February:** Super Extended BASIC, Beginning Assembly Language for the TI, ZORK II.  
**March:** Morning Star Software CP/M Card, WDS/100 Winchester Disk Drive, Sketch Mate, BMC Color Monitor.  
**April:** 9900 Micro Expansion System, Disk + Aid, Gemini 10X-15X.  
**May:** Character Sets and Graphics Design, Draw 'N Plot.  
**June:** GRAPHX, DATA BASE I.  
**July:** Acorn 99, Advanced Diagnostics.  
**August:** Model Dow-4 Gazelle, TI-Artist, PC-KEYS, Not-Polyoptics' Bankroll.  
**September:** Midnite Mason, Myarc 32K/128K Card, GRAPHX Companion.  
**October:** 4A/TALK, Extende BASIC II Plus, XB Detective, Console Writer 2.  
**November:** Foundation Z80A/80-column cards, 9900BASIC, Adventure Editor.  
**December:** Display Enhancement Package, Triple Tech.

### 1986

**January:** BITMAC, Starcross.  
**February:** Night Mission, Peripheral Diagnostic Module, BA-Writer.  
**March:** Super Duper, Tunnels of Doom Editor, Business Graphs 99

### April: U.S. Open Tennis, PRBASE

**May:** 4A Flyer, GRAM Kracker, Artist's Companion.  
**June:** Myarc Disk Controller Card, Maximm.  
**July:** Horizon RAMdisk, Old Dark Caves, Funlwriter, TI99/4A Macro Assembler.  
**August:** JOYPAINT 99, GPL Assembler, TI99/4A Intern, GPL Linker.  
**September:** Mechatronic 128K Card.  
**October:** TI-Forth Utilities, CorComp Memory Plus.  
**November:** Submarine Commander, PEP, MAX-RLE.  
**December:** GK Utility I and II and GRAM Packer, X-10 Powerhouse, RAVE 99/101.

### 1987

**January:** MG DISKASSEMBLER, Myarc XBII.  
**February:** TI-Tax, Mechatronic Mouse.  
**March:** Wycove Forth version 3.0, DUJIT Systems RGB Conversion Kit, Spad XIII Flight Simulator.  
**April:** Geneve 9640, Disk Utilities.  
**May:** QS-Solitaire, Geneve 9640 (Part 2), Technical Drive, Console Calc

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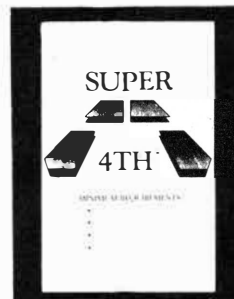
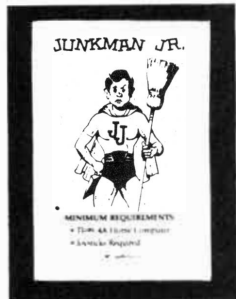
Same as above with the addition of a built-in parallel printer interface which lets you plug any standard parallel printer directly into *Console Calc* with the supplied cable. Start printing your work without the need to purchase any other equipment. (Requires parallel printer.) . . . . . **\$44.95 + S & H**

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# Feedback

## Change statement

Thank you for running my INFORMATION RETRIEVAL PROGRAM in the May issue. I hope that the program will be useful to Rev. Price and anyone else who needs this type of program.

I realize the need to cut the number of DATA statements because of space limitations. However, the original program had eight DATA statements containing titles; and since the printed article omitted the last four, statement 270 should have been changed from DATA 8 to DATA 4.

**Charles E. Kirkwood Jr.**  
**Clemson, South Carolina**

## Aid for modem users

In response to your reader who had trouble dialing DELPHI, our book *The Electric Mailbox* may be of some help. In the appendices, the book has local access phone numbers for Tymnet, Telenet, CompuServe, Dialnet, MCI Mail and Datapac. Tutorial chapters include complete instructions for sending and receiving electronic mail, including telex and paper mail, using any of 13 major services, plus rate structures of the various services and customer service phone numbers.

**Steve Davis**  
**Steve Davis Publishing**  
**P.O. Box 190831**  
**Dallas, Texas 75219**

## TI users would get higher test scores

I venture the thought that if all 99/4A users were tested they would score higher as a group than any other computer user group.

Each of us is more or less satisfied that we do well enough with the primary use(s) for which we originally purchased them. In addition, due to the faithfulness of MICROpendium and several user group publications we are encouraged to try new areas of the TI99/4A's ability.

In 1983 I bought a Missing Link but then due to getting a PEB with a couple of cards and a few bugs the link got tossed into the junk drawer. Good Friday for the first time I got it out and hooked it to a grey case

(new) Banana (old and dusty). It didn't work so I turned it off and thought about it over the weekend. It appeared to me that it was working but the printer just wasn't getting the message. So Monday I concentrated on syntax and although you know that when you hit Enter if it is going to work, it will, I almost left the seat when it did. (I had forgotten how loud a Banana is.)

So what is the bottom line? When others judge their expertise on how much they spent for their rigs I get the satisfaction of knowing why my rig works and the confidence that if it doesn't there is much that I can do before I have to shell out cash and when I do I have access to support that won't cost me an arm and a leg.

**George Allen Shaw**  
**Burlington, Iowa**

## TI GROM chips

A new interest in the TI GROM chips list has been sparked by the mention of my address by Pat Ugorcak in his Super Multi-Card project article (April 1987). The offer was first made in MICROpendium January 1986 issue on page 28.

Please inform your readers that I do not have or sell these listed chips. The chips must be ordered from Texas Instruments Inc., Lubbock, Texas. I am only trying to distribute the information of the parts numbers and prices. I am still requesting that they enclose \$1 for the list. I encourage user groups to reprint the list in their newsletters. The list has been reprinted in our Northwest Ohio 99er News and the West Penn 99ers Club newsletters in February 1986.

**Kent Sheets**  
**Curtice, Ohio**

## Replies to letters

Feedback on Feedback:

1. Glen Lichtenwater (May 1987), on TI accessories: Here is another source. All Electronics, P.O. Box 20406, Los Angeles, CA 90006. Their catalog shows keyboards, \$3.50; power supply boards, \$3.50; power transformers, \$3.50; special on both \$5; video modulator, \$5. Also lithium batteries for Mini-Mem, TTL chips and other.

2. Mike Christianson (May 1987) on keyboards: May not be correct in all cases.

I have keyboards from Korea, Hong Kong and Taiwan. Some have gone bad. No parts are transferrable on mine. Whole keyboards replace each other but not parts.

3. Bill Freese (April 1987), wants black keyboard. I don't think one can ever be found. All Electronics, address listed above, has grey ones.

I strongly urge all 4A users to grab extra modulators, power supply parts, etc., now. When the present supply is gone, you will lose the system if you have not prepared for the drought. The era of the home-made super cartridge, per your June 1985 issue, appears to be over. I just tried to build some more units, and TI says no more PC board #1015921.4 are available.

**Merle Vogt**  
**Von Ormy, Texas**

## Dragonslayer with Myarc RAMdisk

Has anyone found a way to get Dragonslayer auto spell-check to work using Myarc's RAMdisk? I have the Myarc 512 memory card with the 128K EPROM.

I can load TI-Writer and spell-check with dict 1 and 2 into the RAMdisk and everything works fine and fast until it checks for dict 1. At this point I get a prompt to load Disk A in drive 1. If I could get the spell-check to work at RAMdisk speed it would be worth using to check files for spelling errors.

**CW4 John H. Truitt**  
**APO, New York**

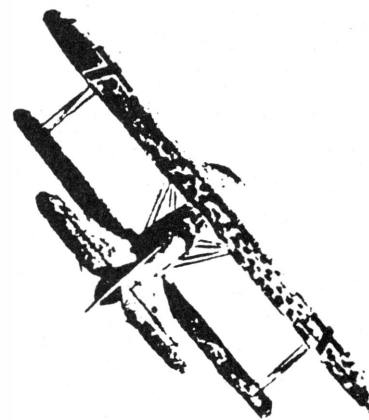
The spelling checker program looks for its dictionaries in DSK1. We've not used it with a Myarc RAMdisk but have used it with a Winchester hard disk. We had to access it through a directory with the pathname of WDS1.DSK1. Trying to access it from any other drive resulted in the program defaulting to floppy drive DSK1. Readers with 512K Myarc RAMdisks may have found a solution to your problem. (Our RAMdisk has only 128K of RAM.) We encourage readers to submit a User Note on this topic.

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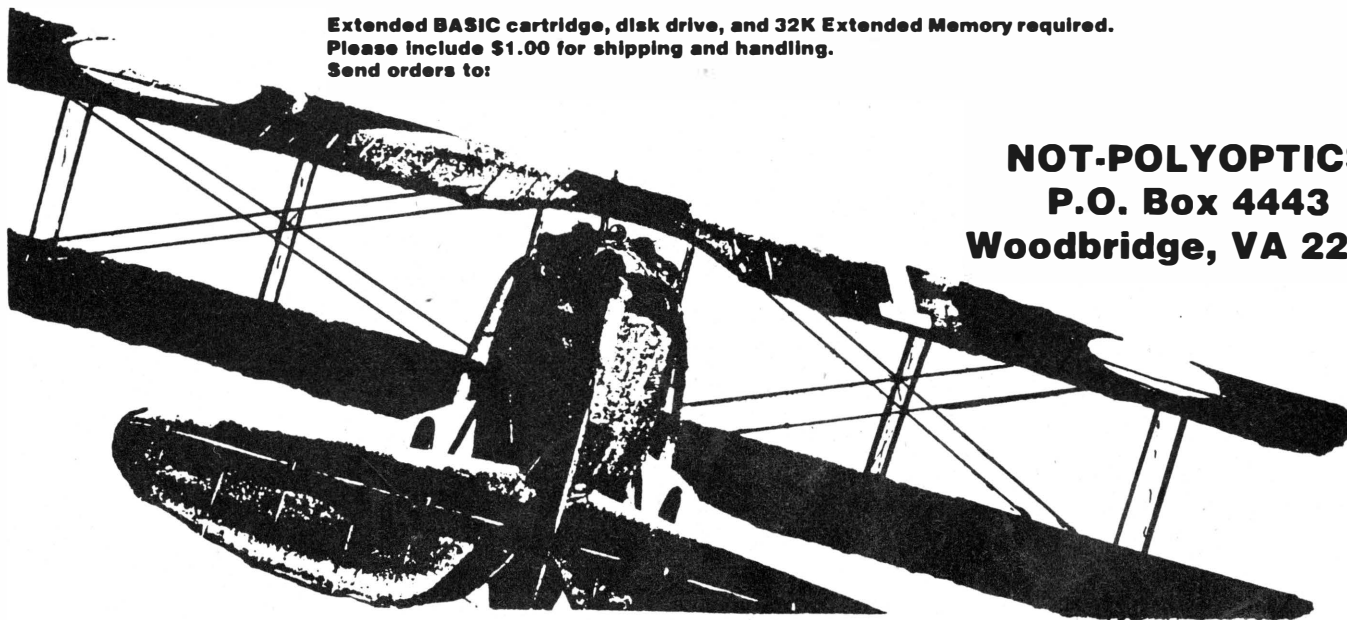
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## BASIC

## Is it 'I' or 'me'?

By REGENA

I noticed my children and quite a few of their friends talked about "Meand"—"Me and Natalie" or "Me and my friends...." Who is Meand?

This program is designed to help the student learn the correct usage of "me" and to choose the correct pronoun, "I" or "me," in a sentence. A randomly generated sentence is printed on the screen. The student must type I or ME to fit the sentence correctly. If the answer is incorrect, the correct pronoun is shown. The quiz consists of 10 sentences, after which the score is printed.

Line 130 uses DEF to DEFine a function R(K) to be a random number from 1 to X. For example, later in the program, R(3) would be a random number from 1 to 3, R(9) would be a random number from 1 to 9 and R(7) would be a random number from 1 to 7. The subroutines in Lines 1020-1060 use this function to choose words or phrases randomly. Wherever the R( ) appears, a random number will be chosen, then the corresponding word or phrase will be printed.

Lines 140-160 print the title of this program. Lines 170-190 define E\$ to be character number 101, which has been redefined to be a red arrow. It is used in printing one of the instruction screens.

Lines 200-270 print the first instruction screen. While the instructions are on the screen, variables are defined. Lines 310-380 read in data for nine different nouns N\$, sentence parts S\$ and prepositional phrases P\$. Notice the DATA in Lines 340-380 are grouped as N\$, S\$, P\$, etc.

Lines 390-430 read in more words, verbs V\$ and partial sentences T\$. After the data, Line 440 calls subroutine 970 to press ENTER.

Lines 450-600 print the next instruction screens, using the "PRESS <ENTER>" routine to continue.

Line 610 initializes the score, SC. Line 620 is RANDOMIZE to mix up the selection of random numbers. Lines 630-870 perform the quiz for 10 sentences.

Line 660 chooses a random number A which may be 1, 2 or

3. Line 670 defines A\$ to be the correct answer "I" or "ME" depending on the random number A. The number A is also used to determine which style of sentence will be printed. Line 680 chooses the appropriate subroutine to print the sentence. Line 690 asks the student to type "I" or "ME".

Lines 700-800 receive the student's answer using CALL KEY. Only the letters I or ME are accepted (although they may be lowercase). The response is printed on the screen, and B\$ is the student's response.

Lines 810-840 check the student's answer with the correct answer and either print the correct pronoun or the message for the correct answer. Line 850 increments the score for a correct answer.

Lines 880-900 print the score after 10 problems. Lines 910-960 print the option to try the quiz again and branch according to the student's response of Y for yes and N for no.

Lines 970-1010 contain the subroutine to print "PRESS <ENTER>." then wait for the student to press the ENTER key before clearing the screen and continuing the program.

Lines 1020-1070 are the subroutines to print the three different styles of sentences. Random numbers are chosen to use words in the different arrays. Using the function R( ) simplifies the program because wherever R( ) appears a random number is chosen (rather than using an equation for each random number and separate statements to choose the words).

Line 1080 ends the program.

You may wish to adapt this program by adding graphics and sound. Perhaps add prompting tones using CALL SOUND and musical interludes for correct answers. You may change the names used for proper nouns in the DATA statements, and you may use different words and phrases to customize your sentences.

*If you prefer to save typing effort, you may have a copy of this program by sending \$3, a blank cassette or diskette, and a stamped and self-addressed mailer to REGENA, P.O. Box 1502, Cedar City, UT 84720. Be sure to specify that you need the TI version of "MEAND."*

## MEAND

```
100 REM MEAND
110 REM BY REGENA
120 CALL CLEAR
130 DEF R(X)=INT(X*RND)+1
140 PRINT TAB(8);"*****
***"
150 PRINT TAB(8);"* M E A N
D *"
160 PRINT TAB(8);"*****
***"
170 CALL CHAR(101,"0B1C3E0B0
B0B0B")
180 E$=CHR$(101)
190 CALL COLOR(9,7,1)
```

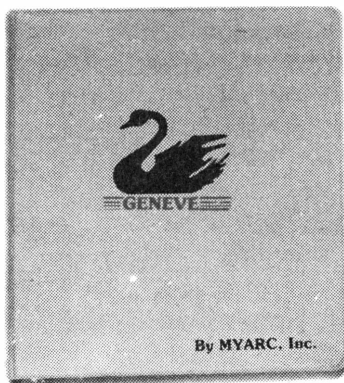
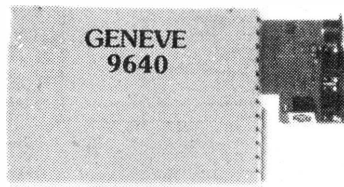
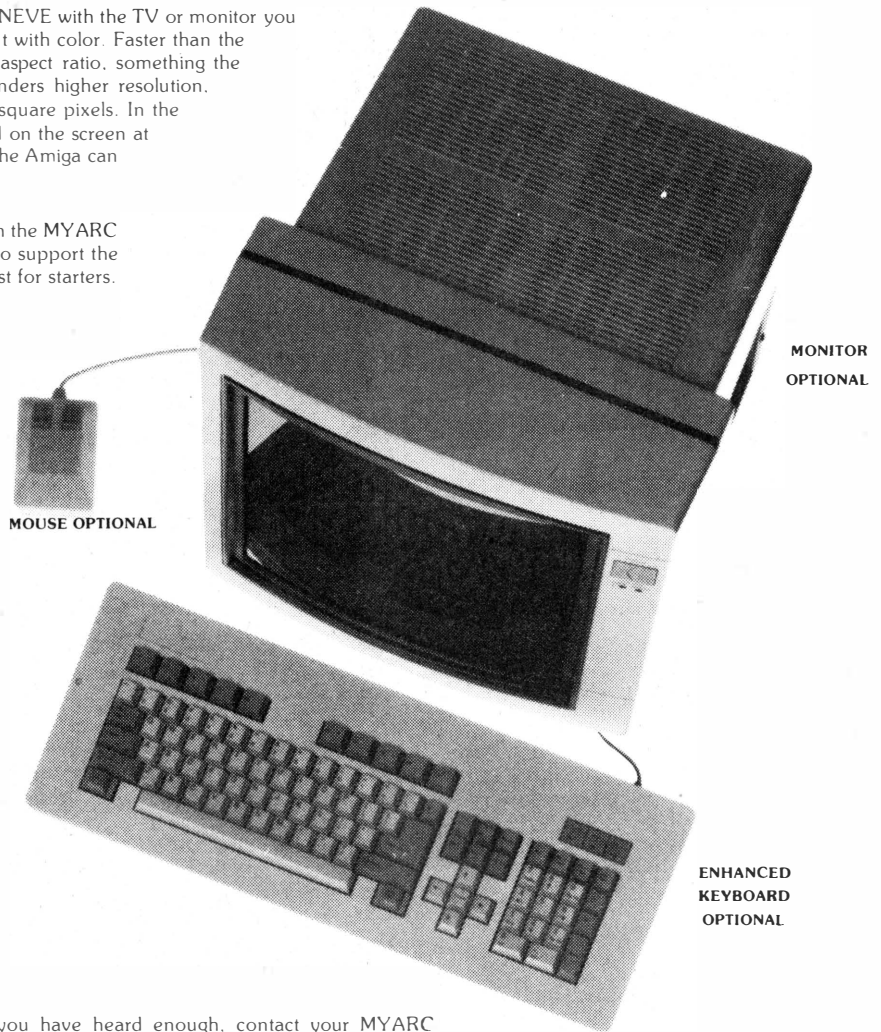
```
200 PRINT : : : "'MEAND' REAL
LY ISN'T A WORD."
210 PRINT : "WHEN YOU ARE TAL
KING ABOUT"
220 PRINT : "ANOTHER PERSON A
ND YOURSELF,"
230 PRINT : "ALWAYS MENTION T
HE OTHER"
240 PRINT : "PERSON FIRST:"
250 PRINT : " YOU AND ME"
260 PRINT : " TERRI AND I"
270 PRINT : " CYNTHIA AND ME
"
280 AA$(1)="I"
```

```
290 AA$(2)="ME"
300 AA$(3)="ME"
310 FOR T=1 TO 9
320 READ N$(T),S$(T),P$(T)
330 NEXT T
340 DATA CHERY,EAT WITH,TO T
HE PARTY,RICK,HE TALKED TO,T
O THE GAME
350 DATA CINDY,THEY CALLED,T
O THE STORE,BOB,WAIT FOR,DOW
N THE STREET
360 DATA KATHY,IT WAS BY,UP
THE HILL,RANDY,SHE TOLD,BY T
(See Page 12)
```

# THE GENEVE 9640 HAS LANDED

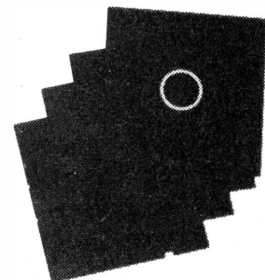
You will recognize it by its trade mark, a graceful gray swan swimming on blue water, an apt symbol. The ugly duckling TI no longer wanted, is no ugly duckling anymore. The GENEVE has surpassed everyone's expectations, even our own; with power, speed, graphics, and adaptability not found in other microcomputers. In fact, the GENEVE does so much, this ad can only begin to tell you about it.

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GENEVE  
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Basking Ridge, New Jersey 07920-1014  
(201) 766-1700



## REGENA—

(Continued from Page 10)

```

HE BEACH
370 DATA JULIE,CARS SPLASHED
, BY THE HOUSE,BRETT,PLEASE T
AKE
380 DATA TO THE LIBRARY,CHRIS,
HE WENT WITH,ALONG THE PAT
H
390 FOR T=1 TO 7
400 READ V$(T),T$(T)
410 NEXT T
420 DATA WENT,DAD DROVE,RODE
, HE SENT,WALKED,THEY TOOK,BI
KED,COME WITH
430 DATA DROVE,GO WITH,ARE G
OING,WALK WITH,WILL GO,DRIVE
WITH
440 GOSUB 970
450 PRINT "USE 'I' IN A SUBJ
ECT."
460 PRINT : "USE 'ME' IN AN O
BJECT."
470 PRINT : "I WENT TO THE
FARM."
480 PRINT E$
490 PRINT : "HE AND I WENT TO
THE FARM."
500 PRINT TAB(8);E$
510 PRINT : "GO WITH ME."
520 PRINT TAB(9);E$
530 PRINT : "GO WITH HER AND
ME."
540 PRINT TAB(17);E$
550 GOSUB 970
560 PRINT "IN THE FOLLOWING
QUIZ,"
570 PRINT : "CHOOSE I OR ME."
580 PRINT TAB(8);" ^ ^"
590 PRINT : "TYPE THE CORRE
CT WORD.": :
600 GOSUB 970
610 SC=0
620 RANDOMIZE
630 FOR C=1 TO 10
640 CALL CLEAR
650 PRINT :
660 A=R(3)
670 A$=AA$(A)
680 ON A GOSUB 1020,1040,106
0
690 PRINT : : : "I OR ME ??
";
700 CALL KEY(0,K,S)
710 IF (K=77)+(K=109)THEN 76
0

```

```

720 IF (K<>73)*(K<>105)THEN
700
730 PRINT "I"
740 B$="I"
750 GOTO 810
760 PRINT "M";
770 CALL KEY(0,K,S)
780 IF (K<>69)*(K<>101)THEN
770
790 PRINT "E"
800 B$="ME"
810 IF A$=B$ THEN 840
820 PRINT : "THE CORRECT WO
RD IS ";A$:
830 GOTO 860
840 PRINT : "THAT IS CORREC
T!":
850 SC=SC+1
860 GOSUB 970
870 NEXT C
880 PRINT "OUT OF 10 SENTENC
ES,"
890 PRINT : "YOU GOT";SC;"COR
RECT."
900 PRINT : : :

```

```

910 PRINT "TRY AGAIN (Y/N)"
920 CALL KEY(0,K,S)
930 IF (K=89)+(K=121)THEN 61
0
940 IF (K<>78)*(K<>110)THEN
920
950 PRINT "NO"
960 GOTO 1080
970 PRINT : : "PRESS <ENTER>."
";
980 CALL KEY(0,K,S)
990 IF K<>13 THEN 980
1000 CALL CLEAR
1010 RETURN
1020 PRINT N$(R(9));" AND
_";V$(R(7));:P$(R(9));"."
1030 RETURN
1040 PRINT S$(R(9));" ";N$(R
(9));" AND ____."
1050 RETURN
1060 PRINT T$(R(7));" ";N$(R
(9));" AND ____ ": :P$(R(9));
"."
1070 RETURN
1080 END

```

## TI user group update

*The following are additions and updates to our user group listing published in the May 1987 issue.*

### Alabama

**South, Mobile, and Alabama Users Group /99** (SMAUG/99), c/o Ollie Hebert, Rt. 4, Box 23, Brewton, AL 36426. Phone: (205) 867-7193. Meets at 7 p.m. first and third Thursdays in Engineering Bldg. Rm. 160, University of So. Alabama campus. Has 15 members. Free cassette, disk, module and newsletter libraries. Founded June 1984. Annual dues \$10 individual, \$15 family.

### Florida

**Miami Users Group**, 19301 N.E. 19 Ave., N. Miami Beach, FL 33179. Phone: (305) 931-3644. John Johnson and Mike Ballman, authors of Horizon RAMdisk Menu 6.3 are members and group has built 23 RAMdisks and has installed the third layer of chips on most of them. BBS (305) 255-3607.

**N.W. Florida 99er Users Group**, P.O. Box 3641, Pensacola, FL 32516. Richard Weaver, president, phone: (904) 944-2770. Meets second Friday and last Saturday of each month. Founded October 1983. Monthly newsletter. Annual dues \$15.

### Illinois

**TI Users Group of Will County**, P.O. Box 216R, Romeoville, IL 60441. Contact: Doug Redmond (815) 741-3272. Group BBS (815) 741-2135. Annual dues \$15. reduced rate for renewing members.

### Missouri

**Jackson County 99ers**, 1017 South 16th St., Blue Springs, MO 64015. Contact: Mike Enzmann, treasurer and newsletter editor (816) 229-0314. Has 25 members. Meets fourth Sunday of each month. Founded January 1983. Annual dues \$10.

### North Carolina

**Charlotte TI99 Users Group**, c/o Robert F. Simms, 3708 Country Club Dr., Charlotte NC 28205 (new address).

### Texas

**Forest Lane Users Group**, P.O. Box 743005, Dallas, TX 75240. Contact: Richard Fleetwood (214) 328-9257 (correction). New TIBBS number: (214)

(See Page 27)

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# Put your speech synthesizer to work as a proofreader

By STEVEN L. RICHARDSON

If you have had a speech synthesizer attached to your TI99/4A computer for very long, it is likely that you might think of it as a novelty, a delightful addition to such games as Parsec, but one that has rarely been able to do anything useful for you. Sure, it's wonderful for education, but after the kid learns to read he is expected to fall into line and read the messages from the screen just like everybody else, and leave the speech synthesizer alone.

This article will explore a use for the little parasite that you might not have thought possible: as an assistant to help you proofread computer programs that you have typed into the computer from MICROpendium program listings, but just can't get to work right.

I don't know about you, but for me the biggest frustration I have is in typing those seemingly endless strings of Os and Fs that will be used in creating graphics. I make other mistakes, too, of course, such as semicolons when there should be colons and insufficient parentheses enclosing math operations. Some of these surface immediately when the program is attempting to RUN, while others nestle among the program lines like kids playing hide and seek, double daring you to find them.

If you have a Terminal Emulator II module plugged into your computer and a program loaded into the memory you can immediately put the speech unit to work by typing LIST "SPEECH". Immediately the computer will begin reading the program to you as quickly as it can, line numbers and all. As it does this, you can attempt to follow along in the program listing. If the program is 200 lines long it won't stop until it's done unless you turn it off or press FCTN QUIT. Of course, you can chop the program up into smaller and more easily handled chunks by specifying which portion of the program you want to hear, as LIST "SPEECH":100-300, but there is a more serious problem to this approach. As the computer reads through the program you can never be sure whether the various words really are spelled correctly, and most repeating characters (like

"FFFFFFFFFFFFFFFF") are pronounced exactly the same if there are 60 of them, or only two. To make matters worse, there are a lot of characters that are vital to the correct operation of the computer that aren't even mentioned by the speech synthesizer. For example, when is the last time you heard your computer pronouncing quotation marks, brackets or exclamation points? Probably not as often as you'd like!

Well, to make a long story short, accompanying this article is a program that will force your computer to acknowledge the existence of every symbol that can be displayed on the screen from the keyboard, and not only that, but also call it by name. Since the TE II module only operates in TI-BASIC, the program will freak out when confronted by Extended BASIC-exclusive commands, such as CALL SPRITE or LINPUT, but it handles those difficult DATA statements and most other program lines in both versions of BASIC very nicely.

You will note that the last line number for the program is 99. This is to allow it to fit before the very beginning lines of the program (starting with 100) and not interfere with the sequence as you type it in. If you don't want to use the speech portion, type RUN 100.

If you do want to use the speech program you need to follow a certain procedure: To begin with, you should list the lines of the program you will want to hear on the screen, locating them within two lines or so from the top. When you have done that, simply type RUN and the speech synthesizer will spell out everything displayed on the screen letter by letter, number by number and character by character. Mercifully, it has been instructed not to bore you with the details of how many empty spaces there are following each program line. Now, by following along in your book, you can mark the places where your typed program disagrees with the HCM version and go back to fix them when convenient. When the computer has said everything on the screen you can list the next sequence on the screen and type RUN again to hear

more. When you no longer need the speech portion of the program, you can delete the first 99 lines of program, or, if you don't mind tying up 1608 bytes of memory, you can add the following line:

```
1 GOTO 100
```

After that, the main program can be RUN in the usual way.

---

## Speak TI-BASIC

---

```
2 REM *SPEAK TI-BASIC PRGM*
   Requires TEII Module
   by S. Richardson, 11/9/86
3 OPEN #1:"SPEECH",OUTFUT
4 FOR Y=1 TO 22
5 FOR I=30 TO 1 STEP -1
6 CALL GCHAR(Y,I,A)
7 IF A<>32 THEN 9
8 NEXT I
9 FOR X=3 TO I
10 CALL GCHAR(Y,X,A)
11 GOSUB 16
12 PRINT #1:B$
13 NEXT X
14 NEXT Y
15 STOP
16 IF A>57 THEN 53
17 IF A<48 THEN 20
18 B$=CHR$(A)
19 RETURN
20 ON A-31 GOTO 21,23,25,27,
29,31,33,35,37,39,41,43,45,4
7,49,51
21 B$="^SPACE"
22 RETURN
23 B$="^EXCLUH MATION POINT"
24 RETURN
25 B$="^QUOTE"
26 RETURN
27 B$="^NUMBER"
28 RETURN
29 B$="^$"
30 RETURN
31 B$="^%"
32 RETURN
33 B$="^&"
34 RETURN
35 B$="^>APOSTRUH _FEE?"
36 RETURN
37 B$="^(?"
```

(See Page 16)



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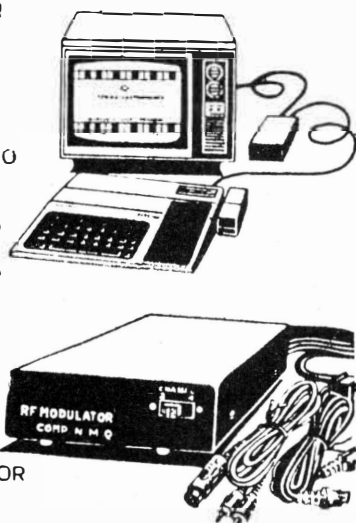
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## SPEAK TI-BASIC—

(Continued from Page 14)

```

38 RETURN
39 B$="^)."
40 RETURN
41 B$="^*"
42 RETURN
43 B$="^PLUS"
44 RETURN
45 B$="^COMMA"
46 RETURN
47 B$="^MINE US"
48 RETURN
49 B$="^PERIOD."
50 RETURN
51 B$="^/"
52 RETURN
53 IF A>64 THEN 69
54 ON A-57 GOTO 55,57,59,61,
63,65,67
55 B$="^COLEN"
56 RETURN
57 B$="^SEMI COLEN"

58 RETURN
59 B$="^LESS THAN?"
60 RETURN
61 B$="^="
62 RETURN
63 B$="^GREATER THAN?"
64 RETURN
65 B$="^QUESTION MARK?"
66 RETURN
67 B$="^@"
68 RETURN
69 IF A>96 THEN 86
70 IF A>90 THEN 73
71 B$=CHR$(A)
72 RETURN
73 ON A-90 GOTO 74,76,78,80,
82,84
74 B$="^< BRACKUT?"
75 RETURN
76 B$="^REVERSE SLANT"
77 RETURN
78 B$="^)" BRACKUT."

79 RETURN
80 B$="^>CIRCUMFLEX"
81 RETURN
82 B$="^UNDER _LINE"
83 RETURN
84 B$="^GRAVE"
85 RETURN
86 IF A>122 THEN 89
87 B$=CHR$(A)
88 RETURN
89 ON A-122 GOTO 90,92,94,96
,98
90 B$="^LEFT BRACE?"
91 RETURN
92 B$="^>VERTICAL _LINE"
93 RETURN
94 B$="^RIGHT BRACE."
95 RETURN
96 B$="^>TILDA"
97 RETURN
98 B$="^DELETE >SYMBOL"
99 RETURN

```

# Control signals

## The whys and wherefores of DTE and DCE

The following is reprinted from the Dallas 99 Interface, newsletter of the Dallas TI Home Computer Group.

By JON HODGES

This article is an attempt to straighten out some misunderstandings about control signals. However, before getting into them, let's look at why they are needed in the first place.

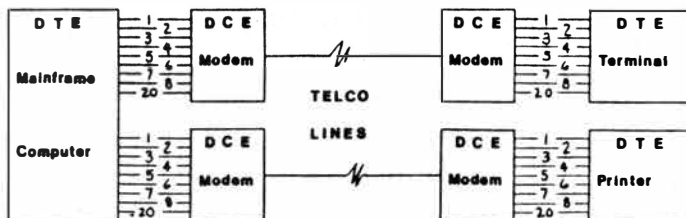


Fig. 1

In Fig. 1, we see a diagram of an early computer-to-terminal hookup. The terminals and computer are called Data Terminal Equipment, and the modems are called Data Communication Equipment. Hence the DTE/DCE designation. The EIA (Electronics Industries Association) released a standard for connecting these types of equipment, designated the EIA RS-232 Standard. It specified that pin 2 of the DTE would be used to transmit data (TXD) to pin 3 of the DCE, pin 3 of the DTE to receive data (RXD) from pin 2 of the DCE, etc. Everything was fine until of-

fice-sized mini and even microcomputers hit the market. Then both the computer and the printer were in the same room, with absolutely no need for modems. Now one had to connect a DTE to a DTE. It was done by crossing the wires between the connectors, as in Fig. 2.

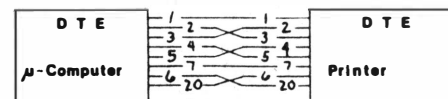


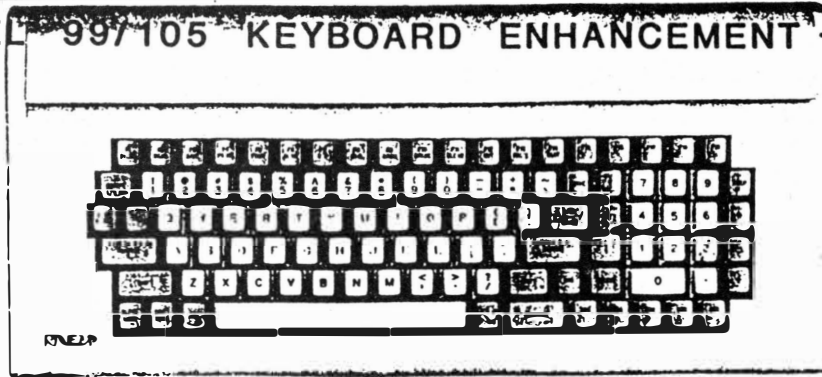
Fig. 2

The following signals are found on a standard RS-232 connector.

PIN	DTE	DCE
1	ground	ground
2	TXD →	TXD
3	RXD ←	RXD
4	RTS →	RTS
5	CTS ←	CTS
6	DSR ←	DSR
7	ground	ground
8	DCD ←	DCD (Data Carrier Detect)
20	DTR →	DTR

TI opted to make it easier for folks by configuring our RS-232 ports as DCE or Data Communication Equipment (MODEM).

(See Page 18)

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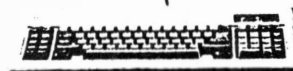
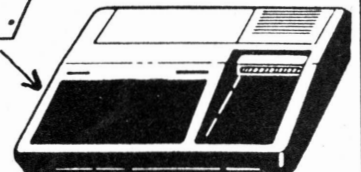
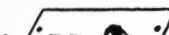
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# CONTROL—

(Continued from Page 16)

With the printer configured as DTE or Data Terminal Equipment (remember, anything hooked up to a computer was a terminal, even if it was read-only), all signals would go straight through on the cable from the TI to the printer or any other DTE equipment (see Fig. 3). This decision created a new problem for acoustic coupler or modem connection to a TI, because now their lines 2 + 3 and 6 + 20 have to be crossed for proper operation (See Fig. 4). This is not to say that TI stood alone in the corner. Osborne and Kaypro also used this scheme.

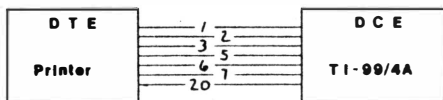


Fig. 3

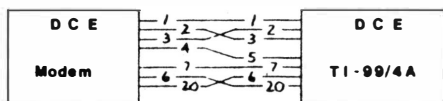


Fig. 4

Data Transfer is fine as long as the receiving unit can catch it all. However, when it cannot, there must be some way to tell the sending unit when to halt data transfer. That is where control signals come in.

DTR/DSR (Data Terminal Ready/Data Set Ready) were devel-

oped for long-distance communication by computers to terminals or printers, and were to indicate that the equipment was hooked up and turned on. The signals are now quite often used to control data flow; that is, DTR is on as long as the terminal is prepared to receive data. However, many modems require a DTR signal to be present or the carrier will be dropped, disconnecting the phone line.

RTS/CTS (Ready to Send/Clear to Send) were developed for half-duplex circuits to signal line turnaround. They are now sometimes used to control data flow. When there is something to send, RTS will be raised, followed by CTS when the receiving unit is ready. When the buffer is full, CTS will be dropped until the buffer is nearly empty.

ACK and NACK (ACKnowledge/Negative ACKnowledge) are control characters originally used on half-duplex circuits to indicate whether a block of data made it OK or not. The sending unit would transmit a block of data, turn the line around and wait for an ACKnowledge. Then the next block would be sent, or, in the case of a NACK, the same block would be sent again. We still use these controls for block transfers on our TIBBS (uploads/downloads). Sophisticated business communications systems like SDLC and X.25 allow up to eight blocks of data to be sent before requiring an ACK1 or ACK2, etc. It is up to the receiving unit to fit the blocks back in their proper order if it requires re-

(See Page 20)

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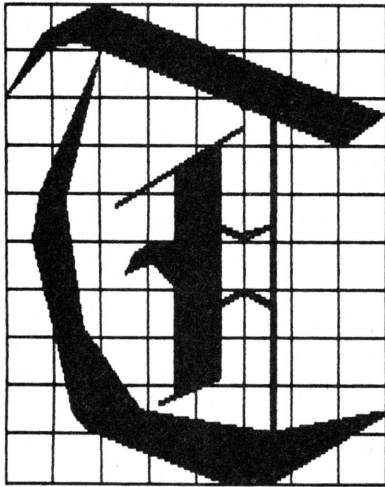
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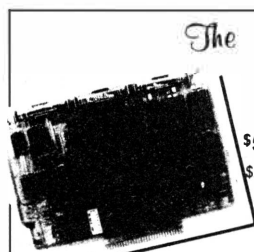
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## CONTROL—

(Continued from Page 18)

transmission of block 3 after it already received blocks 0 through 7.

X-ON/X-OFF (transmit ON/OFF) was a set of control characters developed for full-duplex circuits when buffers came into play: When the buffer was almost full, the X-OFF character was sent by the receiving unit to the sending unit; then when the buffer was almost empty the X-ON character was sent to resume data transfer. As these characters are sent on the data line, it is possible to get by with two lines and a ground for a complete circuit.

BUSY is a signal developed for PARALLEL data transfer, which did not gain popularity until the microcomputer came into being, and is used to indicate that a buffer is full or not accepting data (off-line). Parallel data is transferred by placing a byte of data on the DATA lines, and raising the STROBE signal for a short time. When data is accepted, ACKnowledge is raised, and the cycle repeats until all data have been transferred.

When these signals are exchanged between devices in order to prepare for data transfer, the process is called HANDSHAKING. Normally it will consist of DTR/DSR, then RTS/CTS, then transfer of data. However, any sequence can be valid, as long as both devices are set up for it.

The TI can be set up for handshaking using DSR/DTR. Notice that on the TI Serial Port No. 1 DSR is the output signal on pin 6, and DTR is input from the other unit on pin 20, because the TI port is configured as a DCE. TI also accepts CTS on pin 5, so if that signal drops, TI will stop sending.

One other important note: TI has a second serial port, but uses the same connector. The additional signals can be found on pins 12(DCD), 13(CTS), 14(RXD), 16(TXD) and 19(DTR). DSR is still on pin 6, which means it is shared with Port No. 1. Timing becomes crucial if both ports are handling data, one thing that CorComp had not mastered when they released their Serial card.

Although this article is by no means complete, it should help you on the road to understanding control signals. What is important to remember is that these signals were developed for a specific purpose a long, long time ago, and have since been corrupted by companies seeking to force a customer to use only their peripherals or out of plain ignorance. The result is that making connections is now a task for a detective. However, if you read the manuals, make diagrams and look at them logically, proper handshaking can be quite elementary, My Dear Watson.

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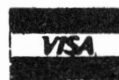
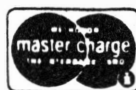
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## Forth tips

# Putting it all together

By LUTZ WINKLER

In April I outlined how to install your preferred character set on the Forth disk and in May I provided information about how to achieve inverse video. Now we can put both of these features together for improving the 40-column editor. The procedure which follows not only corrects TI's omission of autorepeating keys but also changes the character under the cursor to inverse video un-

less it is a blank space. This merely requires that:

- 1) there is a character set loaded into the PDT at >D00,
- 2) the charset is converted to inverse video,
- 3) a few minor changes to screen 38, and
- 4) the addition of screen 41 (which is unused otherwise)

As to the first item, if you have installed your favorite charset on screen 19 (April), all you need to do is a (HEX) 13 BLOCK 100 + D00 300 VMBW. This places a copy of your charset into the upper end of the PDT. To convert this set to inverse video use INVERT from May (HEX : INVERT 1000 D00 DO FF I VXOR LOOP ;). Then install the following on screen 41:

## SCR #41

```
0 ( BLINK & DELAY FOR 40-COL EDITOR )
1 0 CLOAD DELAY
2 BASE->R HEX
3
4 : BLINK ( --- )
5   CURPOS @ DUP VSWR OVER OVER
6   DUP 21 < IF DROP 1E SWAP VSWB
7   ELSE 80 + VSWB
8   THEN
9   B0 0 DO LOOP ( blink rate )
10  SWAP VSWB ;
11
12 : DELAY ( --- )
13   800 0 DO LOOP ; ( repeat rate )
14
15 R->BASE
```

Now modify screen 38 as shown below:

## SCR #38

```
0 ( SCREEN EDITOR 12JUL82 LCT) BASE->R HEX 29 CLOAD DELAY
1 : VED BOX SWAP CLS LISTL !CUR .CUR BEGIN ?KEY DUP IF CASE
   (lines 2 through 9 remain unchanged)
10 7F OF -TAB ENDOF DUP IF > OVER 7F < AND
11 IF DUP EMIT DUP !BLK ELSE 7 EMIT ENDOF ENDCASE
12 BLINK DELAY ELSE DROP BLINK ENDOF AGAIN ; FORTH DEFINITIONS
   (lines 13 through 15 remain unchanged)
```

Before you make this improved editor part of your autoboot, you may want to try one more minor change. On line 3 of screen 34 modify the word BOX to read : BOX 8F7 8F1 DO CC I VSWB LOOP ; which makes the vertical sides of the box-shaped cursor 2 pixels wide and a bit easier to spot. This will provide you with a very satisfactory 40-column editor.

## TI-Artist document offered

Genesis Systems Software of San Diego, California, has released a freeware document concerning the development of TI-Artist character fonts.

According to Lyle Thorogood, of Genesis, the documentation in DV/80 format, can assist anyone in creating "personalized or even commercialized fonts."

Thorogood says the document will be posted on a number of electronic bulletin boards, and will be available to persons sending a diskette with a self-addressed, stamped mailer. Those wishing just a printed copy of the three-page document may send a large, self-addressed and stamped envelope.

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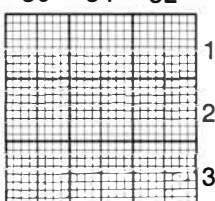
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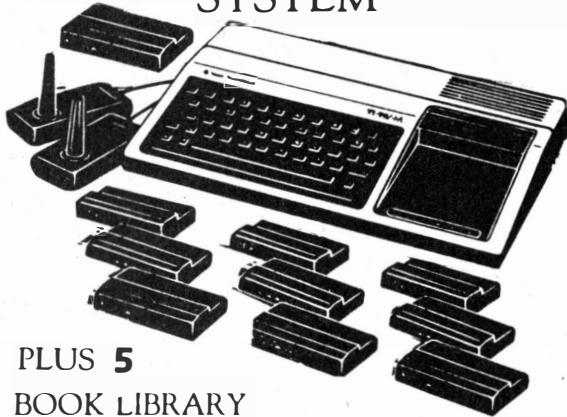
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## Inverse video simulation

# Program adds what TI left out

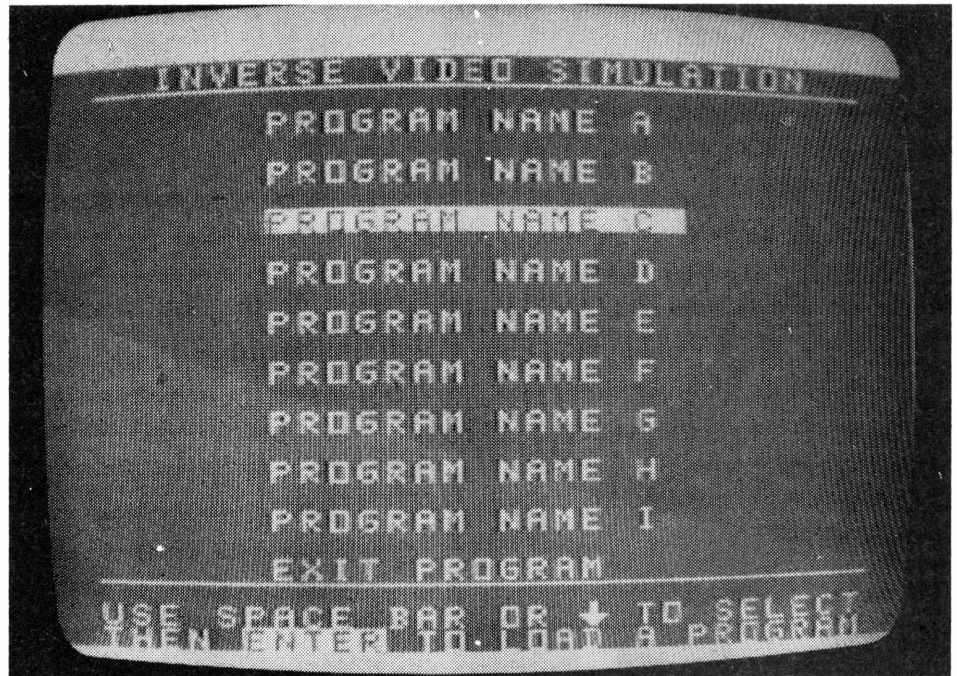
By BILL GASKILL

One of the features built in to many computers is the ability to "CALL" an inverse video function to highlight text displays or input areas on the screen. Commodore home computers use an RVS on or off command for example, which is part of the computer's operating system. Unfortunately, the TI-99/4 and 4A do not have this ability programmed into their operating systems. To obtain the feature one must either purchase JK&H Software's Super Extended Basic, or know how to program it in assembly or Forth.

As I am not proficient in either of those languages, I set about devising a means of obtaining an inverse or reverse video simulation in Extended BASIC, which is my programming language of choice. The result is the program listed below.

Some interesting techniques involving character redefinition, co, or setmanipulation and quirks of 99/4A screen display were necessary to achieve the desired end. However, when I finished, I found that the results were surprisingly close to what I had set out to achieve. The program illustrates what a little creative thinking can do and also probably serves to enforce the old saying that "Necessity is the mother of invention."

The heart of the inverse video set-up is found in lines 100-110. In line 100 the CHARPAT and CHAR commands are used to make lowercase letters appear onscreen as uppercase letters by re-setting the hexadecimal values for ASCII codes 96-127 (the lowercase set) to the same values used by the uppercase characters. Line 110 then makes use of the COLOR command to set color sets 9-12 (which encompass ASCII codes 96-127) to appear on screen as blue letters with a white background. The same line also sets the uppercase letters so that they appear as white on a blue background, which of course is the reverse of the lower case letters. That is really all that is required to set up the ability to display inverse video. The remaining program code involves enhancing the display and putting it to some useful purpose.



The vehicle I chose to do this with is a disk system menu. It displays 10 options on screen and highlights (with inverse video, of course) any option by pressing either the down-arrow key or the spacebar. Once an option is highlighted the enter key must be pressed to select it for loading. As the menu is written, the program to be loaded must reside on the same disk as the menu.

Two important elements in the success of the program must be followed in altering the menu to meet your own needs. First, the screen color MUST be white (color code 16) and second, you MUST insert a Control P character in the spaces between all words written in lower case letters in the listing. The CTRL P (ASCII 144) is an un-displayable character. In other words, it appears as a blank space onscreen and it does not appear at all when this program is listed to your printer. (The CTRL P characters are represented in the accompanying program listing as an underlined, uppercase P. It is included only as a convenience and will not appear on the program entered by readers.) However, it does adopt the color of the screen (white in this case) and serves to fill in the blank spaces between the lowercase words in the menu display. This makes the

highlighted cursor appear as a continuous bar. If the CTRL P character is not included, the spaces between words will be blue instead of white. If the screen color is not 16, then the spaces will appear as whatever color the screen color is.

Thus, when typing in any lowercase words, such as those found in line 140, 320 and lines 460-550, you must include a CTRL P in the spaces between words and also in the three spaces between the last letter in the line and the ending quotation mark.

Line 560 includes the PEEK and LOAD to call the interrupt routine to terminate the program and return the color bar screen if you are using a 32K memory expansion card. Otherwise, you may delete everything after the exclamation mark statement since 16K units will return an error message if the CALL INIT is accessed.

Lines 570 to 660 are used to re-set the lowercase letters back to their original ASCII codes so that they appear as lowercase letters in any program loaded by the menu. If you don't care to use them then you can delete them and the GOSUB 570 statement located in line 450. This will save disk and memory space, but all text

(See Page 26)



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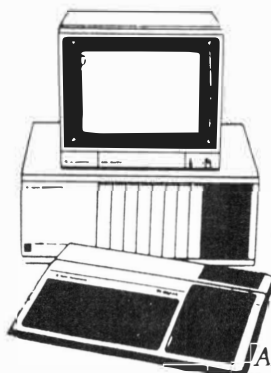
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## INVERSE VIDEO—

(Continued from Page 24)

in the program being loaded will appear as upper case letters even though it may not actually be so.

The color sets that are used in the menu program will remain, unless you change them by including the desired CALL COLOR statement in the program being loaded from the inverse video menu.

To alter the menu for your own use make the following changes:

1. Change the content of the DISPLAY AT statements in lines 140-160. Type in whatever program name you will be loading from this menu. Be sure to type the first option in as lowercase letters.

2. Make the same changes in the values listed for B\$ and A\$ in lines 460-540 and also in the DISPLAY AT statement in line 550. The program names typed in here must be identical to those you typed in at lines 140-160. Make sure that you press CTRL P when the cursor is positioned on a blank space.

3. If you want the highlighted bar to be of uniform length as it is in the simulation

you will have to add the necessary amount of CTRL Ps to the end of any word written in lowercase letters. In the simulation the highlighted bar is 15 characters long, so I added three CTRL Ps to each program name. Of course, all the program names are the same length. That will probably not be the case with your choices, so just pick a uniform length and fill in the remaining unused spaces in that length with CTRL Ps.

4. The last modification takes place in lines 360-440. Here, you must type in the

name of the program to be loaded as it is saved on disk. This usually is not the same name that it is given on the menu display since it can only be 10 characters long when saved on disk.

When saved under the name LOAD on your disk the menu will auto-load and provide a neat looking alternative method of selecting any one of nine programs on your disk. Of course it can be modified to handle as many programs as you can fit on a disk, but that is another story.

### Inverse video menu program

```

80 ! INVERSE VIDEO SIMULATION
90 ! Bill Gaskill
    2321 Wintergreen Drive
    Grand Junction, Colo.
    81506
    (303) 242-8842

100 ON BREAK NEXT :: FOR I=6
5 TO 96 :: CALL CHARPAT(I,A$
):: CALL CHAR(I+32,A$):: NEX
T I
110 FOR I=9 TO 12 :: CALL CO
LOR(I,5,16):: NEXT I :: FOR
I=1 TO 8 :: CALL COLOR(I,16,
5):: NEXT I
120 X=3 :: CALL CHAR(95,"OOF
F"):: CALL SCREEN(16):: DISP
LAY AT(1,3)ERASE ALL:"INVERS
E VIDEO SIMULATION":RPT$(" "
,28):: DISPLAY AT(22,1):RPT$
(" ",28)
130 CALL CHAR(33,"18181818FF
7E3C18"):: DISPLAY AT(23,1):
"USE SPACE BAR OR ";CHR$(33)
:: DISPLAY AT(23,20):"TO SEL
ECT" :: DISPLAY AT(24,1):"TH
EN enter TO LOAD A PROGRAM"
140 DISPLAY AT(3,7):"program
PnamePaP": "          PROGRAM N
AME B": "          PROGRAM NAME
C"
150 DISPLAY AT(9,7):"PROGRAM
NAME D": "          PROGRAM NA
ME E": "          PROGRAM NAME
F"
160 DISPLAY AT(15,7):"PROGRA
M NAME G": "          PROGRAM N
AME H": "          PROGRAM NAME
I": "          EXIT PROGRAM"
170 CALL KEY(0,K,S):: IF S=0
THEN 170
180 IF X=3 AND K=13 THEN 210
190 IF K=32 OR K=88 THEN 200
ELSE 170
200 X=X+2 :: IF X>21 THEN X=
3
210 IF X=5 THEN GOSUB 460
220 IF X=7 THEN GOSUB 470
230 IF X=9 THEN GOSUB 480
240 IF X=11 THEN GOSUB 490
250 IF X=13 THEN GOSUB 500
260 IF X=15 THEN GOSUB 510
270 IF X=17 THEN GOSUB 520
280 IF X=19 THEN GOSUB 530
290 IF X=21 THEN GOSUB 540
300 IF X=3 THEN GOSUB 550
310 DISPLAY AT(X,7)BEEP:A$ :
: IF X=3 THEN 320 ELSE DISPL
AY AT(X-2,7):B$
320 CALL KEY(0,KY,S):: IF X=
21 THEN DISPLAY AT(21,7):"ex
itPprogramPPP" :: DISPLAY AT
(21,7):"EXIT PROGRAM"
330 IF S=0 THEN 320
340 IF KY=13 THEN 350 ELSE 1
70
350 IF X=3 THEN 360 ELSE IF
X=5 THEN 370 ELSE IF X=7 THE
N 380 ELSE IF X=9 THEN 390 E
LSE IF X=11 THEN 400 ELSE IF
X=13 THEN 410 ELSE IF X=15
THEN 420 ELSE IF X=17 THEN 4
30 ELSE IF X=19 THEN 440 ELS
E IF X=21 THEN 560 ELSE 320
360 GOSUB 450 :: RUN "DSK1.P
ROGA"
370 GOSUB 450 :: RUN "DSK1.P
ROGB"

```

See Page 27

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## INVERSE—

Continued from Page 26

```

380 GOSUB 450 :: RUN "DSK1.P
ROGC"
390 GOSUB 450 :: RUN "DSK1.P
ROGD"
400 GOSUB 450 :: RUN "DSK1.P
ROGE"
410 GOSUB 450 :: RUN "DSK1.P
ROGF"
420 GOSUB 450 :: RUN "DSK1.P
ROGG"
430 GOSUB 450 :: RUN "DSK1.P
ROGH"
440 GOSUB 450 :: RUN "DSK1.P
ROGI"
450 FOR I=1 TO 24 STEP 2 ::
DISPLAY AT(I,1):" " :: NEXT
I :: DISPLAY AT(24,1):"LOADI
NG PROGRAM, PLEASE WAIT" ::
GOSUB 570 :: RETURN
460 B$="PROGRAM NAME A" :: A
$="programPnamePbP" :: RETUR
N
470 B$="PROGRAM NAME B" :: A
$="programPnamePcP" :: RETUR
N
480 B$="PROGRAM NAME C " ::
A$="programPnamePdP" :: RETU
RN
490 B$="PROGRAM NAME D" :: A
$="programPnamePeP" :: RETUR
N
500 B$="PROGRAM NAME E" :: A
$="programPnamePfP" :: RETUR
N

```

```

510 B$="PROGRAM NAME F" :: A
$="programPnamePgP" :: RETUR
N
520 B$="PROGRAM NAME G" :: A
$="programPnamePhP" :: RETUR
N
530 B$="PROGRAM NAME H" :: A
$="programPnamePiP" :: RETUR
N
540 B$="PROGRAM NAME I" :: A
$="exitPprogramPPP" :: RETUR
N
550 DISPLAY AT(21,7):"EXIT P
ROGRAM" :: A$="programPnameP
aP" :: RETURN
560 CALL CLEAR :: END !CALL
INIT :: CALL PEEK(2,A,B):: C
ALL LOAD(-31804,A,B)
570 ON ERROR 670 :: CALL CHA
R(97,"00000038447C4444"):: C
ALL CHAR(98,"000000782438247
8"):: CALL CHAR(99,"0000003C
4040403C")
580 CALL CHAR(100,"000000782
4242478"):: CALL CHAR(101,"0
000007C4078407C"):: CALL CHA
R(102,"0000007C40784040")
590 CALL CHAR(103,"0000003C4

```

```

05C4438"):: CALL CHAR(104,"0
0000044447C4444"):: CALL CHA
R(105,"0000003910101038")
600 CALL CHAR(106,"0000000B0
8084830"):: CALL CHAR(107,"0
000002428302824"):: CALL CHA
R(108,"000000404040407C")
610 CALL CHAR(109,"000000446
C544444"):: CALL CHAR(110,"0
000004464544C44"):: CALL CHA
R(111,"0000007C4444447C")
620 CALL CHAR(112,"0000007B4
4784040"):: CALL CHAR(113,"0
000003844544834"):: CALL CHA
R(114,"0000007B44784844")
630 CALL CHAR(115,"0000003C4
0380478"):: CALL CHAR(116,"0
000007C10101010"):: CALL CHA
R(117,"0000004444444438")
640 CALL CHAR(118,"000000444
4282810"):: CALL CHAR(119,"0
000004444545428"):: CALL CHA
R(120,"0000004428102844")
650 CALL CHAR(121,"000000442
8101010"):: CALL CHAR(122,"0
000007C0810207C")
660 RETURN
670 RUN

```

### SUMMER SALE!

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## TI user group update

(Continued from Page 12)

398-7162. Library fee has been dropped, meetings changed to Sunday.

**Pastors' Users Group**, c/o Steve Venable, 1015 West 7th, Plainview, TX 79072 (new address). Phone: (806) 293-3203 or (806) 293-3658. Bi-monthly newsletter.

## Virginia

**Roanoke Valley 99er User Group**, P.O. Box 12522, Roanoke, VA 24026-2522. Leonard Morgan, president. Has 24 members. Meets at 7:30 p.m. first Tuesday of each month. Founded 1983.

## Outside U.S.

### Canada

**The New 99er Users Co-op**, 11320 Galleon Court, Richmond, British Columbia, Canada V7E 4L3. PUBBS Data Line (604) 526-3389; TIBBS Data Line

(604) 531-6423. Meets 7:30-10 p.m. second and fourth Thursday of month (general) and first and third Thursday of month (optional tutorials) at the Stoney Creek Community School, 2740 Beaverbrook Crescent, Burnaby, B.C. Approximately 50 members. Library with more than 300 disks, 25 modules, 50 cassette tapes, magazines and other printed materials. Monthly newsletter. Founded spring 1984. Annual dues \$30.

## Miami BBS logs total of 5,800 messages

Since going on the air in September 1986 the Miami Users group has logged 5,800 messages from 300 users in 16 states, according to Burt Schreiber, secretary of the Miami Users Group in North Miami Beach, Florida.

The Techie board is online 24 hours at 300/1200 baud at (305) 255-6307. It runs with two double-sided floppies, one 10 meg and one 5 meg hard drive. Sysop is B. Meredith.

# Freeware

## Freeware Policies

The Freeware page is a periodic feature of MICROpendium. MICROpendium makes no claims as to the validity of any Freeware offer, nor is there any guarantee that any software will be suitable for any purpose.

### FREWARE REQUIREMENTS

- Disks sent for freeware must be initialized;
- Unless otherwise stated, include a stamped, self-addressed return mailer to receive the Freeware.
- Be patient, those offering Freeware are not doing it for a profit.
- Report any problems you have to MICROpendium

- To encourage continued development of user-supported software, we suggest including a donation of \$3-\$10 for Freeware.

### FREWARE ANNOUNCEMENTS

Anyone wishing to have a Freeware announcement included on this page may do so by submitting a copy and brief description of the program, and a note indicating that it is in the public domain, to MICROpendium.

The complete MICROpendium Freeware listing is available for \$1.50 from MICROpendium. The list is updated quarterly.

## Receivables, Payables added

Don A. Scott, of Route 9 Box 654, Claremore, OK 74017, has added TI-Receivable and TI-Payable to his TI-Ledger program. The two new programs serve as receivable and payable journals. Requirements are memory expansion, disk system, Extended BASIC and TI-Ledger. He asks for \$7.50 if he provides the mailer and media or \$5 if the requestor supplies media and postage-paid mailer.

## Exceptional Games, and more

Steve Patterson, of 2351 Ragan Woods Dr., Toledo, OH 43614, is offering Compati Series and Exceptional Games. He asks \$2 for Compati Series and \$3 for Exceptional Games. Include a postage-paid mailer and diskette for each.

Compati Series consists of three programs that allow the user to place hidden characters into filenames to prevent access by others. The programs allow entry of hidden characters, deletion of hidden characters and reading of files with hidden characters.

Exceptional Games include Mr. Eo, New Horizons Frog, Quickfire, Reverun and Taxman. Quickfire and Taxman run in BASIC. The others are to be used with Extended BASIC.

## XBASIC Graphic Connection

Stephen J. Tuorto, of 18-Chimney Lane, Bayshore, NY 11706, is offering a collection of Extended BASIC programs and graphic pictures to use with GRAPHX, CSDG and TI-Artist. It allows users of GRAPHX to create a CSGD picture with GRAPHX. It also allows the user to create a MERGE program containing the graphic for use in an Extended BASIC program. TI-Artist users may also use the program to convert CSDG pictures to TI-Artist instances. He asks \$2.50 if a postage-paid mailer and disk are included with the order, \$4 if he is to supply postage and media.

## Supersave, games, utilities

Erik Olson, of 6305 Rabbit Ears Circle, Colorado Springs, CO 80919, is offering a program that converts relocatable object code into program files, much like the Editor/Assembler SAVE utility. The advantage of Supersave is that the user doesn't have to make changes to the source code and it adds any E/A utilities that are needed, in the same file, for the program file to run.

Also on the disk are source code for assembly utilities for bit-map, HCHAR graphics, sprites, a terminal emulator, simultaneous

music and sounds, and a string input routine. Other programs include musical demo, several Extended BASIC games and utilities and the Game of Life in assembly with source code.

He asks a donation of up to \$5. Send him a disk and postage-paid mailer. He will provide media and postage for \$3.

## TI-Artist Instances

Howard Uman, of 3913 Sybil Rd., Randallstown, MD 21133, is offering a disk full of Instances for TI-Artist. He asks \$4 for those who send a disk and postage-paid mailer. For \$6 he will supply postage and media.

## Bible Trivia

Steven DeGeare, of 3217 Peery, Kansas City, MO 64127, is offering this Extended BASIC program to those interested in Biblical trivia. The program is menu-driven and features six categories, ranging from the Old Testament to Bible Quotes. The author asks for \$5 from those who enjoy the program. Send a diskette and postage-paid return mailer.

## Disk Utilities updated

John Birdwell, of 7052 Springhill Circle, Eden Prairie, MN 55344, has updated his Disk Utilities program. The version number is 3.3.

New features include the ability to copy files, change file names while copying, override file protection of the destination file, check the destination for space availability prior to copying and move the comment line to the destination file.

Improvements to the sector editor include a flashing cursor, code changes are displayed in inverse video, operational mode is displayed at the top of the screen, fragmented files are indicated by an asterisk and corrects a bug in file operations for files over 256 bytes in length.

Registered users may receive the update by sending a disk and postage-paid return mailer to the author. Or, send \$5 for the update. Also included on the disk is an autodialer for Fast-Term.

## More improvements to Side\*Print

Jim Swedlow, of 7301 Kirby Lane, Stanton, CA 90680, has upgraded Side\*Print. Version 3.4 is now available. Side\*Print prints Microsoft Multiplan spreadsheets sideways.

(See Page 33)

## CSGD III

# For newsletters and more

By KEN GILLILAND

Being a free-lance commercial artist and part-time newsletter editor, I'm always looking for ways to cut down on costs (such as press-type, Zipatone) and speed up production. My computer seemed an ideal way to do this; the only problem was software.

Within the past couple of years, though, there has been a barrage of TI99 font printers, makers and whatnots distributed by various software publishers. My favorite choice has been David Rose's "Character Sets and Graphics Design" Series. In Version I, he provided an editor and printer for various and user-created font types and pictures. In Version II, he added improved assembly routines and a banner printer that would actually print those messages in any font type available to the system. Also, he provided several user-created picture/fonts on support disks. So when Texaments announced CSGD III, I was one of the first on the list to receive it.

CSGD III consists of a Label, Letterhead, Font Printer and Text Document Printer Programs. Also included are no less than 25 new character sets, more than 20 new graphics and six fonts available for the document printer. Complete instruction in D/V 80 files were also included.

**Documentation:** CSGD boots up in Extended BASIC. After the title screen boots up, you are presented with five choices. The first allows you to change your defaults, two choices involve loading the various programs, and there is an option for printing the documentation and an exit option.

Thinking I knew all about CSGD II I ran immediately to the docu-printer option and plunged immediately into a violent stop as the cursor questioned me for a choice of "4, 6, 8, or 9?" Hmmm... a FCTN = solved that problem.

After re-booting the system, I did as all "good" computer users should do. I chose the option to print the documentation. I worriedly watched my printer as it reached "page 20" (Yikes! You mean I have to read all this to run the program?), when delight came to my eye as I saw "QUICK START Instructions" print on the print-

## Review

### Report Card

Performance .....	A
Documentation .....	B+
Ease of use .....	A-
Value .....	A+
Final Grade .....	A

**Cost: \$17.95**

**Manufacturer: Texaments, 53 Center St., Patchogue, NY 11772.**

**Requirements: console, Extended BASIC, disk drive, memory expansion and printer.**

er. In my opinion, this is all you really need to get started.

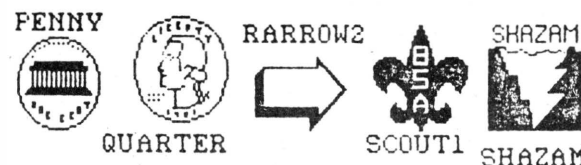
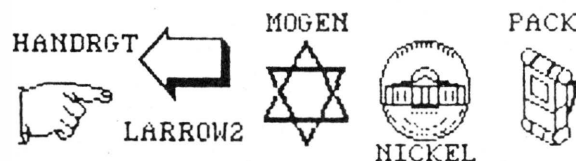
The main instructions are thoughtfully laid out with only a few areas that remain fuzzy. Probably the most confusing is formatting the document to run in the docu-printer program. It tells you that you have 60 characters to a page. What it fails to mention is that a document 60 characters long will leave no margins on the page. I

suggest in your format commands using a ".LM 10;RM 50". That leaves a more comfortable margin. I also found that after you save the document with the TI-Writer Formatter and re-enter the Editor, it is not necessary to do a RS (Replace String) to erase the control codes as the instructions suggest. Simply use PF (Print File) and use this format, "CDSK1.Filename". The "C" deletes all control codes automatically.

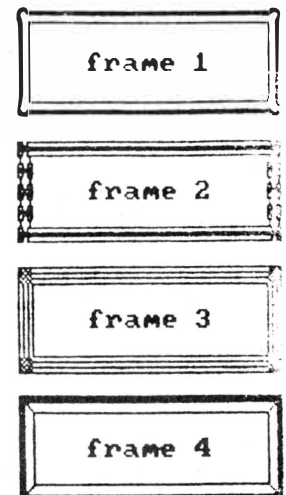
**Ease of use:** For this test, I sat my girlfriend, who has no computer experience whatsoever, down in front of the keyboard. I then handed her the Quick-Start Instructions and quite surprisingly, she made it through with no problem. That says a lot about user-friendliness. Her only complaint, which I also agree with, was that the number commands aren't too consistent. True, all the "9's" mean exit, but 0 to 8 differ on every screen. Alphabetic symbols would have been a better choice, but that's a small complaint. With the Quick-Start instructions nearby, there's no problem figuring what numbers mean what.

**Performance:** The first item that caught (See Page 33)

### SMALL GRAPHICS (cont)



### Label Frames



## Writerease Version 1.1

# A versatile word processor

By HARRY T. BRASHEAR

The TI community is frequently subject to rapid software upgrading. Usually these upgrades are minimal and many would probably go unnoticed except for the change in version numbers. Also, there's a lot of duplication, e.g. how many sector editors do you have? However, once in a while something really new and better comes along, as in the case of the Writerease word processor.

Writerease Version 1.1 is CorComp's first venture into the world of software development and, I hope, it won't be their last. This is an outstanding effort. They have lessons to learn, of that there is no doubt, but if you want to open up a whole new potential in word processing — read on.

I knew this program was coming as of last fall but it didn't arrive on the commercial market until just a month or two ago. I ordered my copy from Tenex and waited with bated breath for its arrival. I had visions of spending days plowing through a giant new manual like the one that came with TI-Writer. You can imagine my shock when my supermanual turned out to be three 8½ by 11 sheets of paper. So be it! I grabbed my package of two disks (the main program and a dictionary) and headed for the system.

CorComp's object is to get you into the program as fast as possible. After informing you of the minimum system requirements, (basic P-box, 32K card, RS232, one drive and a printer), you are instructed to boot the program disk and install a text file for further information. This file mainly consists of all the key commands and a short description of what each one does. Frankly, if I were green at word processing, I would have been in deep trouble starting right then.

I decided that for the moment I would keep it simple and put the dictionary in drive one after the main program was in. CorComp would like to see you dump the dictionary into one of its 512K cards for faster access, but the company also notes it will work nicely from the floppy. (More on this later.) All you have to do is tell the processor where the dictionary is by press-

## Review

### Report Card

**Performance.....A**  
**Ease of use.....A**  
**Documentation.....D**  
**Value.....B**  
**Final grade.....B**  
**Cost: \$49.95**  
**Manufacturer: CorComp Inc., 2211-G E. Winston Rd., Anaheim, CA 92806**  
**Requirements: Console, floppy disk drive, memory expansion, printer and printer interface, and Extended BASIC, Editor/Assembler or Mini-Memory**

ing CTRL Y and entering a number from 1 to 6 or "R" for the CorComp RAM.

Next, set up your indent and margins. This is easy but can also shock the daylights out of you when your cursor hits column 80 and just keeps going (if you want) all the way out to column 255. The possibilities are mind boggling. If you like to print in 132-column condensed, you can set the margin at 132 and know exactly what you are going to get on the line. What you see is what you get. My printer happens to be a 15-inch Gemini and I can't wait to be able to columnize this entire width of paper with no hassles about where things are going to land. Don't panic! All of your text files from TI-Writer are still good. The minimum file size is Display Variable 80, just like it has always been, but the file size increases automatically if required. You do have to keep in mind that if you get on the other side of 128 columns, you're only going to get one line of text to a sector. Make darn sure you have enough disk room for the save.

Entering text is cut and dried, but the cursor action is a little different. If you are at the end of a line and want to move up the text columns, the cursor ignores empty spaces and kind of bounces up the edge. This was an aggravation at first but I soon got used to it. Also, I should tell you that the windowing action of TI-Writer is gone. As you type past the right side of the screen

your document moves smoothly, one column at a time, to the left. It is great to be able to actually read something word for word that requires more than 40 columns.

The formatter is a thing of the past with Writerease. Since what you see is what you get, there is no need for necessary space markers (), ampersands (&&) or @@ signs. But again, a greenhorn is going to be in big trouble here. Many of us moldy old TI'ers have gotten into the habit of using printer codes embedded into the text to save time. That's how CorComp wants you to set up your documents for special printing. Fine! But the documentation concerning this is so poor it's practically nonexistent. The documentation tells you what keys produce the numeric codes but not a word about what they do. In other words, pressing "O" will get you a code for 15, but the documentation doesn't explain that this will produce compressed print. Don't give me the excuse that "all printers are different." There are standards called Epson and Gemini that everybody starts with no matter what printer you own.

In other cases, features of the program aren't described clearly enough to work with. For instance, the speed of Search and Replace strings are much touted in the ads for Writerease. I couldn't get "Replace String" to work at all. After half an hour of "hacking," I discovered that you had to "home" the cursor to the beginning of the text to make it work. Once I discovered that, I also found that the speed factor was fantastic, but there wasn't one word about homing in the docs.

Copying, deleting, and moving chunks of text is easier than ever. No more jotting down line numbers that have to be entered. You just position a full length line above and below the piece you want moved and where you want it moved to. Press "M" each time and it's quickly shoved into place. You can delete or "kill" a part of a line, merge another file anywhere you want in the text, show directory, everything you are used to or wish you could do. It's all easy as pie.

The crowning glory of Writerease is the  
**(See Page 33)**

## 4A DOS

# Monty Schmidt's new disk utility

By JOHN CLULOW

4A DOS, written by Monty Schmidt, is a sophisticated utility program which contains many of the commands found in MS-DOS, Microsoft's Disk Operating System for IBM compatibles. 4A DOS allows convenient access to file management functions, but some special features of the program make it highly flexible and very easy to use.

The BATCH command, for example, allows you to execute DOS commands from a text file you have saved on disk. In effect, this makes 4A DOS programmable: You can customize sequences of commands to fit your system and your application. Batch files can even be made to execute automatically upon selection of the program, just like AUTOEXEC files in MS-DOS.

You can also use 4A DOS to load assembly language programs and link to them, making the program expandable. On the disk I was given to test, for example, there were routines to check, compare and format disks as well as one to load TI-Writer so that when you leave it you're back in DOS. This gives 4A DOS its own "built in" text editor!

4A DOS works like a command module. When you power up the system, the last menu selection is 4A DOS, and you select it just as you would any other command module. The program loads into command module memory space, so in order to use it you need a device that has battery-backed command module RAM memory. You can use a Super-Cart or Super Multi-cart (MICROpendium, June 1985 and April 1987). Super Space, GRAM Kracker, Maximem or other such device. Depending upon the market for the program, the company may eventually make it available as a command module with the program on an EPROM.

4A DOS commands used with files include COPY, DELeTe, ERASE, PROTECT, RENAME and UNPROTECT. TYPE allows you to display VAR and FIX 80 files to the screen, and you can use CTRL-S and CTRL-Q to stop and start the display. There are commands to set up your printer specification and to direct out-

## Review

### Report Card

**Performance.....A**  
**Documentation.....A**  
**Ease of Use.....A**  
**Value.....A**  
**Final Grade.....A**

Cost: \$19.95

**Manufacturer: Ryte Data, 210 Mountain St., Haliburton, Ontario, Canada K0M 1S0**

**Requirements: Disk system with 32K memory and a device with battery backed RAM in the command module address space (>6000->7FFF; e.g., a Super-Cart, Super Multi-cart, Super Space, GRAM Kracker, Maximem, etc.**

put to the printer when desired.

Commands like DIRectory and DISK-NAME pertain to the entire disk. You can also link to assembly language files like CHKDSK, COPYDISK, CMPDSK and FORMAT.

Certain commands are used primarily in BATCH files. They include CLS (clear screen), ECHO ON/OFF (can suppress display of batch commands to the screen), REMark, WAIT (a "press any key to continue" prompt), BEEP, HONK and ONKEY. ONKEY allows the BATCH program to accept a single key input for menu selection of batch file functions.

Another group of commands allows direct access to the computer's memory. DUMP gives a hexadecimal display of the number of bytes specified. INIT sets up the low 8K like the Editor/Assembler module would for execution of DIS/FIX 80 files.

While working in 4A DOS, the disk drives are considered volumes: DSK1, DSK2, etc. You can change the default drive specification with VOL. Another useful command is MORE which allows you to have the screen display stop every 24 lines until a key is pressed.

The BATCH feature of 4A DOS is an important aspect of the program. Here is

an example that illustrates it use. When preparing a new system disk, you'll want to copy the system files onto it. The easy way to do this is to create a BATCH file that you can use any time you want to make a new system disk. Using a text editor like TI-Writer, you could write the BATCH file:

```
ECHO OFF
CLS
REM -----
REM          SYSTEM-BAT
REM -----
REM This BATCH file copies all
REM system files. Use DSK2 as
REM the target drive.
REM.....
WAIT
CLS
REM Copying files...
ECHO ON
COPY CHARA1 DSK2.CHARA1
COPY CHKDSK DSK2.DISKCOPY
COPY EDIT40 DSK2.EDIT40
COPY EDITA1 DSK2.EDITA1
COPY EDITA2 DSK2.EDITA2
COPY FORMAT DSK2.FORMAT
ECHO OFF
CLS
REM New system disk is done.
DIR DSK2.
REM To return to 4A DOS...
WAIT
CLS
```

This BATCH file would be saved with the -BAT extension attached; for example SYSTEM-BAT. To execute all of the commands in the file, all you have to do is enter SYSTEM from 4A DOS. SYSTEM could also be called from another BATCH file: BATCH files can be chained together!

Briefly, SYSTEM shuts off the command echo, displays the name of the BATCH routine and then executes a WAIT. The WAIT displays the message, "Press any key to continue..." (This would give the user a chance to put a formatted disk in DSK2.) Following a key press, the screen is cleared and the message "Copying files..." is displayed. Then ECHO is turned on so that each of the COPY commands will be displayed as

(See Page 33)



## PRESCAN\_\_IT

# Speed up your XB loads

By BOB CARMANY

Did you ever wonder what your Extended BASIC program was doing after the disk drive stopped and before the program began to run? If you have read your XB manual, you will remember that it is pre-scanning the program.

During this period, it is allotting space for arrays, initializing variable and just doing the "housekeeping" chores necessary to RUN the program.

One of the least documented features of Extended BASIC is how to turn on and off this pre-scan to speed up program execution. The process is really quite simple—technically, that is. But you are faced with organizing all of the keywords, variables, strings, arrays and such and inserting them at the front of the program. Then, you have to figure out exactly where to turn on the pre-scan and where to turn it off. If the program is very long, this "simple" task can take what seems like forever.

Fortunately, there is hope! J. Peter Hoddie has marketed a program called PRESCAN\_\_IT through Asgard Software that does all of this (and more) automatically.

**Performance:** PRESCAN\_\_IT does exactly what it says it will! That is not too unusual, but in these days of sometimes exaggerated claims, it is refreshing to find a program that lives up to its advance publicity. You must keep in mind, however, that PRESCAN\_\_IT is written in Extended BASIC itself, so it is not going to set any records for speed. When you consider the alternative (doing the work by hand) it is a real timesaver. Exactly what does it do? Well, starting with a MERGE type program file, PRESCAN\_\_IT will create another MERGE file from your program, and once SAVED, will boot almost instantaneously after it loads. PRESCAN\_\_IT functions quite smoothly and I have found that there are very few programs that cannot be easily converted with it. I experienced no problems with any of the options. Everything was relatively simple and straightforward.

**Ease of use:** The program is menu-driven and extremely easy to use. If you follow the instructions, you should have no problems with it. You simply RESequence

## Review

### Report Card

Performance.....A  
Documentation.....B+  
Ease of use.....A+  
Value.....A+  
Final Grade.....A

**Cost: \$10**

**Manufacturer: Asgard Software, P.O. Box 10306, Rockville, MD 20850.**

**Requirements: console, monitor or television, disk system, XB, 32K memory expansion and a second disk drive optional but strongly recommended.**

the program that you are working on starting with 100 and then SAVE it in a MERGE format in accordance with your XB manual instructions. Once it is SAVED, place the PRESCAN\_\_IT disk in drive 1 and chose XB—the program will auto-LOAD. You are presented with a menu of options to choose the version of PRESCAN\_\_IT that conforms to your system configuration. There is a version for 32K, a "generic" version, a version for 16K, and an exit back to Extended BASIC.

Once the choice has been made, it is just a simple matter of following the input prompts. You are prompted for the name of the input file (the one you saved in MERGE format), an output filename and then a prompt for a specialized Extended BASIC file. PRESCAN\_\_IT has three files on the disk for some of the specialized Extended BASIC variations that contain CALLs that are not found in the TI Extended BASIC module. MYARC is for the Myarc XBII, MECHA is for the Mecha-tronics XBII+ and MG is for the Millers Graphics Extended BASIC. If your program does not contain any of these versions, enter the null prompt. You also have the option of creating your own specialized files, as well.

Next, it allows you the option of replacing as many as five numbers with variables to save memory. In a long program,

the memory savings can be considerable—particularly if you use the same number over and over again.

The program will ask if you wish to replace all of the REMs with an "!" for another savings in memory space.

Then, it will ask if you want a complete MERGE file created. If you answer "Y", the program will create a complete file that can be MERGED into memory and RE-SAVED as a RUNnable program. If you answer "N", PRESCAN\_\_IT will create a short MERGE file that can be MERGED back into the program with all of the necessary pre-scan information. The advantage is that the program will be processed much faster!

Once you have answered all the prompts, PRESCAN\_\_IT will begin processing the program. The status window will tell you what PRESCAN\_\_IT is doing by line number and which variable or word it is processing. At this point, if your program is a long one, it might be wise to go take a coffee break! The program is doing all the work and it may take a while! It is still much faster and more convenient than doing the job by hand.

**Documentation:** The documentation is adequate for using the program. Some improvements could be made to make reading and finding the discussion of the individual options more convenient. The documentation for the variants of Extended BASIC could have been expanded, for example, and each prompt segment could have been set off by either a Roman numeral or a section number to make it easier to read. But, all in all, the documentation fully describes the program's function.

**Value:** The price of a mere \$10 makes PRESCAN\_\_IT one of the better software buys on the market today. The program is professionally done and worth every penny of the price. The first long Extended BASIC program that you convert will make you happy that you spent the money for PRESCAN\_\_IT. No more waiting for a program to start after it loads and you don't have to do the tedious job by hand!

**Final grade:** All of the convenient built-in functions and the fact that the program

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## WRITEREASE—

(Continued from Page 30)

dictionary, or spelling checker. This is something we had before but most of us elected to "look it up instead" because it was so slow. Not so with Writerease. I was very apprehensive before I received this program because I was afraid that CorComp was going to make the spelling checker so that it would only work out of a CorComp RAMdisk. No problem. It will load into any RAM, as well as work directly from the disk drive. It's fast enough from the drive to satisfy anybody, but from my Horizon RAM it acts like it is the right arm of the program.

There are two commands to check spelling.

1) CTRL C will check a single word that the cursor is under. You get a column of 20 words that closely resemble the specified word. If the word is spelled correctly it is underlined in the column. If not, you can compare it to what's there or move ahead by 20 words to find it. Once you have found your word, you drop out of the checker with FCTN 9 and enter a correction or go on with your text. I don't have words to express the speed that this all happens with. You have to see it to believe it.

2) CTRL A will check your entire document with equal speed. It's transparent to capitalization so you don't have that to worry about any more. It stops for you to check words it can't find then continues when you are satisfied. You can look at the word, correct it, then pick up where you left off. What could be easier?

Was I disappointed with anything? Yes, a little here and there. I'm going to miss a couple of dot commands from TI-Writer like .CE (center line), .IF (include file), .LS(line space) and, most of all, .AD (adjust right margin). These were the commands that the program took care of. The printer has no idea what they do, so embedded commands will be of no help. Also, I would like to include the program in my RAM but it's protected to the nines so my old BA-Writer will be closer at hand and still be used quite a bit. CorComp has always been very good about upgrades and correcting things, so go ahead and enjoy the newfound freedom that Writerease will give you and trust a great company. Well done, CorComp!

## 4A-DOS—

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it is executing. When all system files have been copied, the screen is cleared and a message is displayed followed by the directory for DSK2. The user is then prompted to press any key to return to 4A DOS. When a BATCH file reaches the end of its commands, control is automatically returned to 4A DOS. (Unless, of course, a BATCH command has linked to an assembly language program or chained to another BATCH file.)

Remember that any DOS commands can be used within a BATCH file, and that the ONKEY command allows single key input as a BATCH file is executing, and you'll begin to see some of the extraordinary flexibility 4A DOS offers.

If you have the Mechatronics 80 column display card, the command WIDTH 40/80 is used to toggle between the two modes. An 80 column TI-Writer Editor will be sold separately.

Those who had a chance to see 4-A DOS at our local users group meeting were really impressed. Some people, who had not seen a real use for the Super-Cart before, got busy and built one just for use with 4A DOS. There is so much crammed into 4A DOS that it does take some time to become familiar with all the possibilities. But if you take the time to learn how to use it, I'm sure that, like me, you won't want to be without it.

## PRESCAN\_\_IT—

(Continued from Page 32)

does not require a fully expanded system are enough to give the program a high "final grade." When these conveniences are coupled with the professional presentation of the program and the easily mastered menu-driven nature of it, the final grade has to be an "A." I would heartily recommend PRESCAN\_\_IT to all of you who write your own programs or would just like someone else's program to boot faster without that seemingly endless wait while it initializes. J. Peter Hoddie has scored again with PRESCAN\_\_IT!

## Freeware

(Continued from Page 28)

The program now supports the following printers: Gemini 10X, Epson FX80, Panasonic KP-P1090, Epson Graphics, Tandy DMP-105 and DMP-130, Okidata ML92, ML93 and ML182 (and most Okidata printers with dot-addressable graphics, Gorilla Banana, GP 550TI, HP 2225C, Olivetti PR2300 and the C. Itoh Prowriter.

New features include the ability to print double-strike graphics for better resolution, faster program loading and file printing, improved documentation and error handling and faster operation with the KX-P1090. Another character set has been added for printers using Epson graphics that produces large, easier to read printouts.

Send \$5 (\$7.50 in U.S. funds for overseas orders).

## Kwikfont

Wayne Stith, of 715 Timken Dr., Richmond, VA 23229, is offering a character definition utility. The utility allows the user to manipulate ASCII characters 32-144, mirror images, reversals, etc. Character sets may be saved to disk in DV/80 format for access by a BASIC program. The source code is available as a heavily commented tutorial on assembly language, and occupies both sides of a floppy. Send \$6 to the author.

## CSGD III—

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my eye was the speed of the document printer. I had expected to wait hours for my long text-file to be dumped in one of the six fonts. Surprisingly, the printer moved along at a fairly fast rate (approximately 25-30 CPS). Not bad for the quality of printing you get. My only complaint is that there is no way to produce any new fonts to use with the docu-printer. I'm sure, though that such a way will soon be forthcoming from Dave Rose.

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# Newsbytes

## Chicago Faire slated for fifth straight year

The Chicago-Area TI99/4A Users Groups announces that its fifth annual Chicago TI99/4A Computer Faire will take place from 9 a.m. to 6 p.m. Nov. 7 in the Ironwood Room at Triton College in Fiver Grove, Illinois.

Theme of this year's Faire, according to organizers, is "The Computer that Refuses to Die!!!"

Triton College is located at 2000 North Fifth Ave. in River Grove (¼ mile north of the Maywood Race Track).

The Chicago Users group is the largest users group in the United States, with more than 800 members from around the world. The 1986 Faire attracted more than 1,500 attendees.

This year's Faire is being held in conjunction with the Milwaukee Users' Group and the Wisconsin TI Council, whose Faire will be held in Milwaukee, Wisconsin, Nov. 8.

Discounts for exhibitors, speakers or attendees at a rate of \$65 per night per single or double occupancy are available at the O'Hare/Kennedy Holiday Inn if reservations are made through the Chicago Users Group. The group will provide transportation to and from the O'Hare/Kennedy Holiday Inn on the day of the Faire. A hospitality suite will be set up at the same place, where a "Friday Night Social Mixer" is scheduled for the night before the Faire.

A catered dinner is scheduled for Saturday night for exhibitors and persons involved in producing the Faire. The dinner will be available for a minimal charge, according to Don Jones, Faire Chairman.

Booths are available for \$75 each to exhibitors, with an initial purchase limit of no more than two booths. Exhibitors who are members of the Chicago group may purchase their first booth for \$60. Booths measure approximately 8'x10'. After Oct. 1, any remaining booths will be made available on a limited "first come, first served basis for those desiring additional space. Electricity will be provided where necessary, with enough power to operate display sighting and approximately two

TI99/4A systems. A charge of \$15 rental fee per basic TI system will also be assessed.

For further information, or to reserve a booth, contact Marcy Brun 9 a.m.-9 p.m. CST at (312) 348-0108. If unable to contact her, call Don Jones, 8:30 a.m.-10 a.m., noon-4 p.m. or 8 p.m.-10 p.m. at (312) 869-3378. If unable to reach him, call Sandy Bartels 9 a.m.-11 p.m. at (312) 859-3850.

## BBS upgrades listed

The 99 BBS in Whittier, California, now at version 7.4, features multiple message bases, 10 info files, online adventure games, downloads, uploads, online help file, BBS lists and user group lists, according to sysop Roger Davis.

Davis says new additions include scanning the message base, rereading a message, redoing user information, backspacing ("not just erase, you can do special effects"), clearing screen ("more special effects") and a hot key main menu.

The board operates 24 hours, seven days a week at 300 and 1200 baud at (213) 947-7777.

## Tax return form input requested

James Sleeth of El Cajon, California, who offered Multiplan templates for 1986 federal tax forms, says he would like to know if TI users want him to do this again. He says that if so, they should send him a stamped self-addressed envelope for future notification of the time frame and price of 1987 forms.

Sleeth says that users who want to become tax preparers for their respective states or who want to write forms for their states and link to Sleeth's forms should also send self-addressed stamped envelopes. Sleeth will choose one person from each state to link and reproduce his forms per an agreement to be worked out. He will forward the names of volunteers from the same state to the person selected.

For further information, write Sleeth at Financial Management Consulting, P.O. Box 20723, El Cajon, CA 92021.

Sleeth says he would like to hear from

other users who have written or improved financial programs.

## Myarc Inc. receives Front Ranger award

Myarc Inc. of Basking Ridge, New Jersey, has been awarded the ninth Front Range 99er Outstanding Support Award.

Joe Nuvolini, president of the Front Range 99er Computer Club of Colorado Springs, Colorado, said in the club's letter to Lou Phillips, president of Myarc, that the company's "tireless efforts on Myarc's disk controllers, memory expansion cards, RAMdisks, Extended BASIC II and now the 9640, have given 99/4A owners reason to keep and expand their systems."

## Tex-Comp distributes 500XJ joystick

Tex-Comp of Granada Hills, California, announces distribution of a new joystick.

The British joystick, the 500XJ, is being marketed by Tex-Comp as the Super Joystick III.

Jerry Price of Tex-Comp says the joystick features precision control in both eight-way and four-way modes without the necessity of gate switching which has been required in past units to obtain high scores in maze-type games such as Munchman. The new joystick also provides the accurate control and response required for creating graphics for screen displays or printouts, he says.

The joystick uses positive micro switches instead of leaf contacts, he says. He notes that many of the newer coin-operated arcade games are being equipped with this type of joystick due to improved response and durability.

Price says that because of the precision movement resulting from the separate microswitch for each direction, the joystick is also ideal for creating computer graphics with programs such as Graphx, Paint & Print and TI-Artist. It rivals a trackball in performance, he says.

The Super Joystick II sells for \$24.95 and comes with a two-port TI Joystick Adapter. A set of two Joysticks and an a

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# User Notes

## Funlwriter and XBASIC II

This comes from Bill Burnette of Fayetteville, North Carolina:

You probably already know that Funlwriter won't work with Myarc Extended BASIC II. Actually, it does load and seems to operate properly except there is no video display. This is because Myarc Extended BASIC II uses a different area of VDP RAM for the screen image table than does TI Extended BASIC.

One of the finer points of Myarc Extended BASIC II is the ability to load and run compressed object code directly from BASIC using the "RUN" command.

## CSGD III—

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But that's a small complaint. This Document Printer alone is worth the price of the program.

The Labelmaker and Letterhead Programs are quite nice too. In the Label program, you can use any CSGD Fonts and Graphics to create a label, then save it to disk. The parameters are adjustable to accept any label you can fit in your printer. In the Letterhead maker, again you can use any fonts and graphics and save a letterhead file to disk. In addition, you can have the letter head on just the top or bottom, or on both top and bottom. Unfortunately, the document printer program doesn't work in conjunction with the letterheads. But I'd imagine with some modification the programs would work nicely.

The Message Printer is a vast improvement over CSGD I and II. It's faster, more efficient and most importantly, all on one screen. It will accept any CSGD font and print it with or without graphics.

**Overview:** I believe the CSGD series is probably the best in the field of font graphics for the TI99, with CSGD III leading the pack. Within the entire series of CSGD products there are more than 100 fonts available, not to mention more than 350 graphic pictures. This series definitely makes the TI99/4A a powerful graphic tool and a must for any commercial artist or newsletter editor.

While playing around with this feature I found out if I put Funlwriter into DSK1. and typed RUN UTIL1 that the Funlwriter main menu appears. All the Funlwriter programs appear to operate properly. If I load DM1000 and copy the Funlwriter disk to my Myarc RAMdisk, I can get Funlwriter to run from the RAMdisk by selecting option 4 from the "Files" section of DM1000 and reloading Funlwriter from the RAMdisk.

What a team! Myarc RAMdisk, Extended BASIC II and Funlwriter.

## Printing files

Don Hale has a routine that allows users to print a text file without a word processor. The program is set up for use with DV/80 files but can be adjusted for use with others by modifying lines 150 and 160. For example, to read Direct Writer files use these lines:

```
150 OPEN #1:"DSK1."&F$,INTERNAL,RELATIVE :: FOR X=2 TO 61
160 INPUT #1,REC X:C$ :: PRINT #7:C$ :: IF EOF(1) THEN END
```

```
100 ! TO READ D/V80 FILES
110 !
120 DISPLAY AT(12,1)ERASE ALL: "EXACT NAME OF FILE ON DISK 1"
130 ACCEPT AT(13,1)BEEP:F$ :
: IF LEN(F$)<1 OR LEN(F$)>10
OR POS(F$," ",1)>1 THEN 120
140 OPEN #7:"PIO" ! OR RS232, ETC.
150 OPEN #1:"DSK1."&F$ :: FOR X=1 TO 10000
160 LINPUT #1:C$ :: PRINT #7:C$ :: IF EOF(1) THEN END
170 NEXT X
```

## Newsbytes

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adapter sell for \$39.95. The joystick can be ordered without the adapter for \$14.95 each. The adapter retails for \$10.95 separately.

The joystick comes with a five-year factory warranty and is available from Tex-Comp, P.O. Box 33084, Granada Hills, CA 91344 or (818) 366-6631.

## A short fuse

Hank Avaro, of the OH-MI-TI user group of Northwood, Ohio, had a problem with a fuse going out in the transformer of his PEB. His solution to the problem is detailed below, having first appeared in the Northwest Ohio 99er News.

Have you ever had a fuse blow on your PEB? And you replaced it with more than a 1.5 amp fuse because that's all you had?

Well, that just happened to a friend of mine. He used a 2 amp fuse because his box had died. When he turned it on the fane came on okay, but there were no lights on any of the boards. A few checks with the old VOM meter showed that the low voltage for the cards was missing. Into the power supply we went. A few more checks showed that there was no power coming out of the transformer.

Disaster for sure. TI will sell a new transformer for *only* \$70, plus shipping and handling, or the company will accept the entire PEB and repair or replace whatever is necessary for \$55. I think they are trying to tell the fix-it-yourselfers something.

The reason for this mess is that TI, in its infinite wisdom to prevent a fire, installed fuses *inside* the transformer. They are 2 amp quick blow fuses and are not readily accessible. If you are adventurous, you can remove the internal fuse.

### HOW-TO

Remove the transformer so you can easily work on it. Find the primary, or the 110V side. Then carefully open the plastic covering on the side with the white wire. There are two fuses inside. The first one you will see is the 220V tap and should not be bothered. It is located in the middle of the opening. However, the fuse you are looking for is stuck on the far side of the windings, and beyond removal without doing damage.

Not to despair, very carefully follow the white wire. You will see it connected to a silver lead going to the side of the transformer. This is the wire from the fuse. The wire going to the fuse is under a coating of insulating paper right under the silver wire. This wire is small and fragile, so carefully locate it and cut it as close to the fuse as you can. Then gently bend it

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# User Notes

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around the silver lead and solder it there. Don't cut the silver lead, as it will weaken the hold of the white wire.

Now check to make sure you have a good connection. If everything is okay, use epoxy to secure the wires. Then cover the transformer as well as you can and reinstall the transformer.

So as not to waste the money you just saved, cut the white wire going to the fan. Now install a fuse holder in line with the remaining white wire going to the transformer. Reattach the wire for the fan to the switch side of the new fuse holder. Use a 1½ amp fuse.

You now have the same protection as before, but it will be a lot easier to fix the next time the fuse blows. All you will have to do is replace the fuse in the fuse holder. (By the way, the real reason for all this trouble with my friend's PEB was a couple of shorted diodes in the 12V side of the power supply board.)

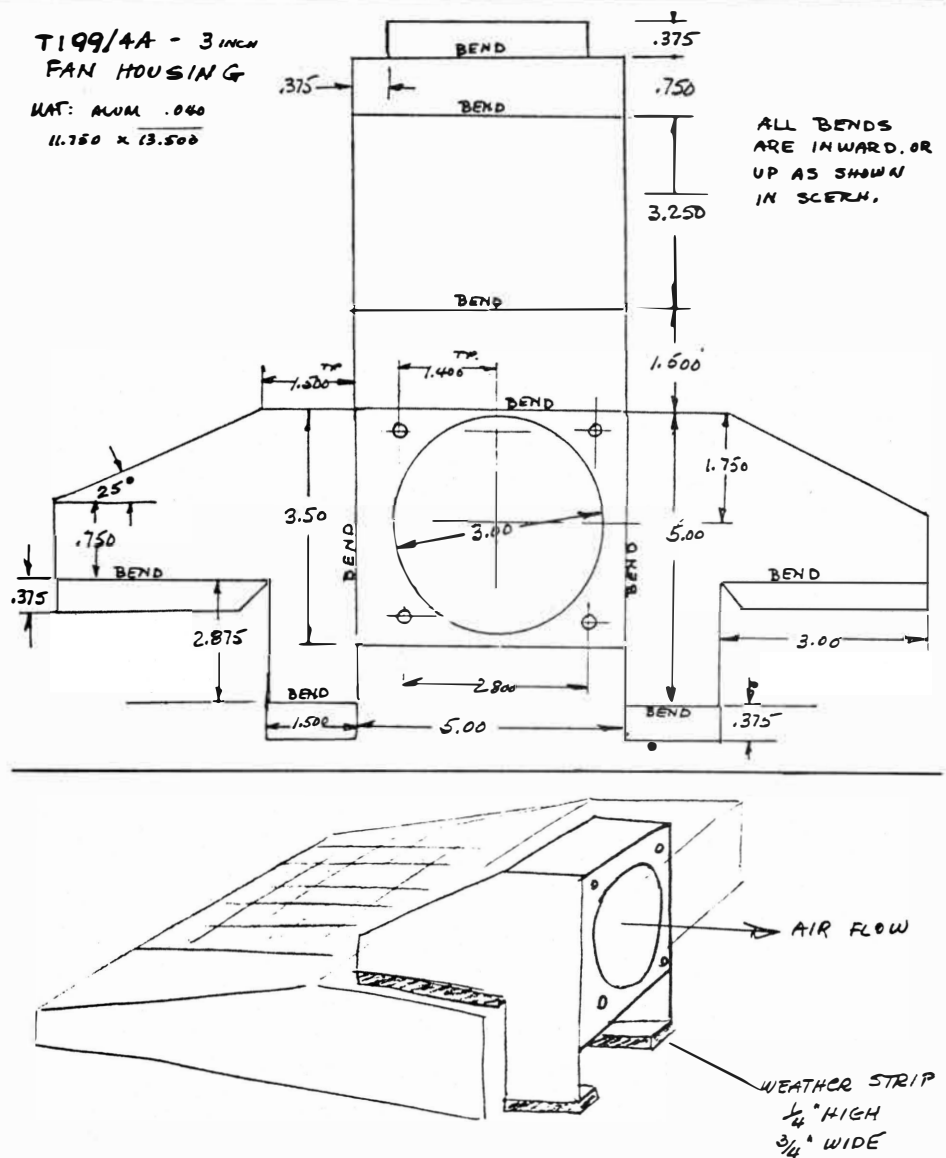
*MICROpendium cautions inexperienced readers not to attempt hardware modifications without the advice of experienced users. Local user groups are a good place to start when seeking technical advice of this nature. See the May 1987 edition of MICROpendium for a listing of user group contacts.*

## Fans cools console

Enrico Gasperini, of Towaco, New Jersey, was a victim of console lockup due to excess heat. He solved it by attaching a fan to the back of the console. He provided plans so that other readers can do the same.

He writes: I've had the condition of computer lockup many times, especially with the Extended BASIC cartridge installed. I have read about changing the power supply with a Radio Shack surplus TI supply, and also the use of fans. Well, I have one of the new power supplies but decided to try my hand at building a fan housing of my own. It works so well that I thought some of your readers might like to try building one for themselves.

I made my housing from .040-inch aluminum sheet metal, but it could be made out of cardboard such as Baimbridge



Art Board. If you use aluminum, make a paper template and paste it to the aluminum so it will be easier to cut out. Before cutting the large hole and four mounting holes for the fan, make sure your fan matches the layout. If it does not, make the necessary changes before you bend the box. When the layout is cut make all the bends inward on the lines indicated.

The finishing touch is to cover the box with a black satin finish self-stick vinyl, such as Con-Tact, which is available in the houseware departments of department stores.

I also applied a strip of foam weather-strip to the bottom surface that comes in contact with the top of the console over the vent louvers to prevent scratches. A similar

piece of weather-strip must be added to the bottom of the pedestal that rests on the table below the fan, or the box will fall over.

## File dump program in hex and ASCII

Chuck Reinhart of Bellaire, New York, describes the following utility as a "user friendly" file dump program. "It is the ultimate in file dump programs because information about the file (such as file type and length) is not required," he writes. Readers will have noticed a number of useful utilities by Reinhart that have appeared in recent editions of MICROpen-

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dium, and this utility adds to his contributions.

The program, which requires an expansion memory, disk system and Extended BASIC — a printer is optional — will dump the contents of a file to a printer or display the file contents on the screen. It will display any file type, except program.

The program is fully prompted. To run it, select the drive number of the file to be read, the output device (screen or printer), and whether you want the file to appear as hex or ASCII. Actually, as the accompanying printout shows, the hex dump includes an ASCII equivalent as well.

After making these decisions, the program will catalog the disk, listing the first 34 files it encounters to the screen. You select the file by entering the corresponding number, from 1 to 34, and the program takes care of the rest. The file reading may be stopped or restarted by depressing the spacebar.

Reinhart says the program supports the Foundation 128K card, "but due to the file structure of the card you will have to enter the file name, file type and record length for that file."

When the file has been read and outputted, another file may be read by pressing the enter key.

```
100 REM SAVE DSK2.FILE-DUMPL
110 C$="1" :: GOTO 160 :: DI
M B$(34)
120 CALL ERR(W,X):: GOTO 140
130 CALL ERR(A,D):: ON ERROR
120 :: CLOSE #D
140 IF D<>5 THEN PRINT : : "*"
** I/O ERROR -RETRY ***" : :
:ELSE PRINT : : " *** END O
F FILE ***" :: IF L>0 THEN P
RINT #L: : :,"*** END OF FIL
E ***"
150 INPUT F$ :: GOSUB 620 ::
RETURN 170
160 CALL CLEAR :: CALL SCREE
N(5):: FOR A=1 TO 12 :: CALL
COLOR(A,2,8):: NEXT A :: CA
LL VCHAR(1,31,1,96)
170 L=0 :: DISPLAY AT(2,7):"
FILE DUMP PROGRAM": : " DS
K (1-6,X) ";C$: : : : "
PRINTER S": : " OR
```

## SEQUENTIAL DUMP OF

TIMP.DATES

FILE TYPE IS INTERNAL

RECORD TYPE IS VARIABLE 100

08 40 02 00 00 00 00 00	00 08 40 0E 00 00 00 00	(.0.....0.....)
00 00 08 40 56 00 00 00	00 00 00 07 32 2F 31 34	(...0V.....2/14)
2F 38 36 08 41 16 23 00	00 00 00 00 03 50 49 4F	(/86.A.0.....PIO)

\*\*\* END OF FILE \*\*\*

```
SCREEN": : : " HEX OUTPUT
N"
180 ACCEPT AT(5,17)SIZE(-1)V
ALIDATE("123456X")BEEP:C$ ::
ACCEPT AT(11,17)SIZE(-1)VAL
IDATE("PS")BEEP:D$ :: ACCEPT
AT(17,17)SIZE(-1)VALIDATE("
NY")BEEP:E$ :: ON ERROR 130
190 IF C$<>"X" THEN DISPLAY
AT(21,2):"PLACE FILE DISK IN
DRIVE ";C$: : "<ENTER>" ::
ACCEPT AT(23,24)BEEP:F$ :: G
OSUB 620 :: GOTO 210 ELSE DI
SPLAY AT(5,2):"FILE NAME": :
: : " 1-DIS/FIX": " 2-DIS/VAR
": " 3-INT/FIX"
200 DISPLAY AT(12,2):" 4-INT
/VAR": : : " RECORD LENGTH
80": : : ACCEPT AT(5,16)SIZ
E(10)BEEP:G$ :: ACCEPT AT(12
,16)VALIDATE("1234")SIZE(1)B
EEP:F :: ACCEPT AT(16,16)VAL
IDATE(DIGIT)SIZE(-3)BEEP:H :
: GOSUB 620 :: GOTO 260
210 OPEN #1:"DSK"&(C$)&".",I
NPUT ,RELATIVE,INTERNAL :: I
NPUT #1:F$,C,C,D :: DISPLAY
AT(1,3):"AVAILABLE=";D;"USED
=";C-D: : " FILENAME", "
FILENAME": " -----", "
-----" :: FOR C=1 TO
34
220 INPUT #1:B$(C),H,A,D ::
IF LEN(B$(C))=0 THEN 240 ::
IF ABS(H)>4 THEN 220 :: IF C
<18 THEN DISPLAY AT(C+4,3-LE
N(STR$(C))):STR$(C);"-";B$(C
)ELSE DISPLAY AT(C-13,15):ST
R$(C);"-";B$(C)
230 NEXT C
240 DISPLAY AT(23,3):"SELECT
```

```
A FILE" :: ACCEPT AT(23,17)
VALIDATE(DIGIT)SIZE(2)BEEP:D
:: IF D<1 OR D>C THEN 240 :
: G$=B$(D):: CLOSE #1 :: OPE
N #5:"DSK"&(C$)&".",RELATIVE
,INTERNAL,INPUT :: INPUT #5:
F$,A,A,A :: I$=F$&". "&G$
250 INPUT #5:J$,F,H,H :: IF
J$<>G$ OR F=5 THEN 250 :: CL
OSE #5
260 IF D$="S" THEN I=14 :: J
=4 :: K=22 ELSE I=41 :: K=59
:: L=4 :: J=16 :: OPEN #L:"
PIO"
270 ON F GOTO 280,290,300,31
0
280 OPEN #5:"DSK"&(C$)&". "&(
G$)&".",FIXED H :: GOTO 320
290 OPEN #5:"DSK"&(C$)&". "&(
G$)&".",VARIABLE H :: GOTO 33
0
300 OPEN #5:"DSK"&(C$)&". "&(
G$)&".",FIXED H,INTERNAL :: G
OTO 320
310 OPEN #5:"DSK"&(C$)&". "&(
G$)&".",VARIABLE H,INTERNAL :
: GOTO 330
320 PRINT :: INPUT " ENTER S
TARTING RECORD:";C :: FOR A=
0 TO C-1 :: INPUT #5:K$ :: N
EXT A
330 GOSUB 620 :: DISPLAY AT(
14,12):"WORKING" :: J$="SEQU
ENTIAL DUMP OF" :: GOSUB 430
:: J$=I$ :: GOSUB 430 :: J$
="FILE TYPE IS " :: IF F<3 T
HEN J$=J$&"DISPLAY" ELSE J$=
J$&"INTERNAL"
340 GOSUB 430 :: J$="RECORD
TYPE IS " :: IF F=1 OR F=3 T
(See Page 38)
```

```

HEN J$=J$&"FIXED" ELSE J$=J$
&"VARIABLE"
350 J$=J$&" "&STR$(H):: GOSU
B 430 :: IF E$="Y" THEN 440
360 INPUT #5:K$,:: N=LEN(K$)
:: IF N=0 THEN 360 :: O=O+N
:: GOSUB 580 :: P=1 :: IF N<
>8 THEN 410 :: IF ASC(SEG$(K
$,1,1))>128 THEN 370 :: IF A
SC(SEG$(K$,8,1))>0 THEN 410
370 FOR A=1 TO 8 :: Q(A)=ASC
(SEG$(K$,A,1)):: B$(A)=STR$(
Q(A)):: IF (Q(A)>99)+(A>2)<>
-2 THEN 380 :: P=0
380 NEXT A :: IF P=0 THEN 41
0 :: M$="" :: IF Q(1)<128 TH
EN 400
390 FOR A=1 TO 2 :: C=Q(A)-1
27 :: B$(A)=STR$(Q(A)-C*2+A)
:: NEXT A :: M$="-"
400 M$=M$&B$(2)& "." :: FOR A
=3 TO 8 :: M$=M$&B$(A):: NEX
T A :: M$=M$&"E"&STR$((VAL(B
$(1))-64)*2):: PRINT #L:VAL(
M$),:: GOTO 420
410 PRINT #L:K$;
420 PRINT #L:" " :: IF H<>25
5 OR O<H THEN 360 :: INPUT #
5:K$ :: GOTO 360
430 PRINT #L:TAB(I-LEN(J$)/2
);J$: :: J$="" :: RETURN
440 E$="0123456789ABCDEF0" :
: FOR A=1 TO 17 :: B$(A)=SEG
$(E$,A,1):: NEXT A :: GOSUB
550
450 INPUT #5:K$,:: N=LEN(K$)
:: D=1 :: GOSUB 460 :: FOR D
=D TO N :: N=ASC(SEG$(K$,D,1
)):: GOSUB 460 :: NEXT D ::
GOTO 450
460 U=INT(N/16):: V=N-16*U :
: N$=N$&B$(U+1)&B$(V+1):: IF
(N<32)+(N>126)=-1 THEN O$=O
$& "." ELSE O$=O$&CHR$(N)
470 T=T+1 :: O=O+1 :: GOSUB
580 :: IF T/8<INT(T/8)THEN
480 :: N$=N$& " "
480 N$=N$&" " :: IF T<J THEN
490 :: GOSUB 540
490 IF O<H THEN 530 :: ON F
GOTO 510,530,500,530
500 IF H<>255 THEN 510 :: IN
PUT #5:K$
510 D=1024 :: O=0 :: IF T=0

```

```

THEN 520 :: GOSUB 540
520 IF F<>3 THEN 530 :: PRINT #L:" " :: N$="00 = "
530 RETURN
540 PRINT #L:N$;TAB(K);O$&")
"
550 IF F=3 THEN 560 :: N$="
" :: GOTO 570
560 U=INT(O/16):: V=O-16*U :
: N$=B$(U+1)&B$(V+1)&" = "
570 O$="(" :: T=0 :: RETURN
580 CALL KEY(O,W,X):: IF X=0
THEN RETURN ELSE CALL SCREE
N(11):: DISPLAY AT(24,7):"**
E = END **"
590 CALL KEY(O,W,X):: IF W=6
9 THEN 610 :: IF X=1 THEN 60

```

*User Notes is a column of tips and ideas designed to help readers put their computers to better use. The information provided here comes from many sources, including TI home computer user group newsletters. MICROpendium pays \$10 for any item sent in by readers that appears in this column. Mail user notes to: MICROpendium User Notes, P.O. Box 1343, Round Rock, TX 78680.*

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